

Conformed through Addendum #19

**MASSACHUSETTS BAY
TRANSPORTATION AUTHORITY**

**AUTOMATED FARE COLLECTIONS
SYSTEM SERVICES**

**REQUEST FOR PROPOSALS
FOR
SYSTEMS INTEGRATOR**

November 15, 2016,

As Amended October 12, 2017

TABLE OF CONTENTS

| | | |
|---------|---|----|
| 1. | Introduction | 1 |
| 1.1 | Request for Proposals | 1 |
| 1.2 | Eligibility to Participate in this RFP | 1 |
| 1.3 | Structure of this RFP | 1 |
| 1.4 | Glossary | 2 |
| 1.4.1 | Abbreviations | 2 |
| 1.4.2 | Definition of Terms | 3 |
| 2. | Project Overview | 6 |
| 2.1 | Background | 6 |
| 2.2 | Project Description | 6 |
| 2.3 | Project Goals | 6 |
| 2.4 | Scope of the Contract Services | 8 |
| 2.4.1 | Responsibilities of the Systems Integrator | 8 |
| 2.4.2 | Form of Proposed Project Agreement | 10 |
| 2.5 | Role of the MBTA | 10 |
| 2.6 | Design and Implementation Considerations | 11 |
| 2.6.1 | Technical Requirements | 11 |
| 2.6.2 | DB Installation Work | 11 |
| 2.6.2.1 | Scope of DB Installation Work | 11 |
| 2.6.2.2 | Responsibilities of the DB Entity | 12 |
| 2.6.2.3 | Exclusions to the Scope of the DB Installation Work | 13 |
| 2.6.2.4 | DB Entity Procurement | 14 |
| 2.6.2.5 | Proposal Requirements | 14 |
| 2.7 | Committed Financing | 14 |
| 2.7.1 | Private Financing of the Project | 14 |
| 2.7.2 | Plan of Financing | 15 |
| 2.7.3 | Financing the DB Installation Work | 15 |
| 2.7.4 | Interest Rate Risk | 15 |
| 2.7.4.1 | Benchmark Interest Rate Risk | 15 |
| 2.7.4.2 | Credit Spread Risk | 16 |
| 2.7.5 | Allocation of Costs between APC, APO and APT | 16 |
| 2.7.5.1 | APC | 17 |

Massachusetts Bay Transportation Authority

| | | |
|---------|--|----|
| 2.7.5.2 | APO | 17 |
| 2.7.5.3 | APT | 17 |
| 2.7.5.4 | Capital Costs Reporting | 18 |
| 2.7.6 | Financial Model Updates | 18 |
| 2.7.7 | MBTA Optional Termination Compensation Proposal | 18 |
| 2.7.8 | Equipment Price Catalogue | 18 |
| 2.8 | Sources of Funds | 18 |
| 2.9 | Security for Performance and Insurance | 19 |
| 2.9.1 | Proposal Letter(s) of Credit | 19 |
| 2.9.2 | Security for Performance under the Project Agreement | 19 |
| 2.9.3 | Insurance | 19 |
| 2.10 | Governmental Approvals | 20 |
| 2.11 | Tax Considerations | 20 |
| 2.12 | System Expansion | 20 |
| 2.13 | Demonstrations and Reference Project Site Visits | 20 |
| 2.13.1 | Demonstrations | 20 |
| 2.13.2 | Reference Project Site Visits | 22 |
| 2.13.3 | Findings and Observations | 23 |
| 2.14 | Governing Law | 23 |
| 2.14.1 | Applicable Law | 23 |
| 2.14.2 | Compliance with Standards, Codes and Laws | 23 |
| 2.14.3 | Evidence of Corporate Registration | 23 |
| 2.15 | Diversity Requirements and Fair Employment | 24 |
| 2.15.1 | Diversity | 24 |
| 2.15.2 | Networking | 24 |
| 2.15.3 | Fair Employment Practices | 24 |
| 2.16 | Background Documents | 24 |
| 2.17 | MBTA Consultant Support Team | 25 |
| 2.18 | Closing Checklist | 26 |
| 3. | RFP Procurement Process | 26 |
| 3.1 | Procurement Objectives | 26 |
| 3.2 | DB Entity Procurement | 27 |
| 3.3 | Procurement Schedule | 27 |
| 3.3.1 | Procurement Schedule for Systems Integrator | 27 |

Massachusetts Bay Transportation Authority

| | | |
|---------|---|----|
| 3.3.2 | Procurement Schedule for DB Entity | 29 |
| 3.4 | Communications | 29 |
| 3.4.1 | Point of Contact | 29 |
| 3.4.2 | Rules of Contact | 30 |
| 3.4.3 | Proposer Questions and Answers | 31 |
| 3.4.3.1 | Generally | 31 |
| 3.4.3.2 | Individual Meeting Materials | 32 |
| 3.5 | Existing Conditions | 32 |
| 3.6 | Inspection of MBTA Vehicles | 33 |
| 3.7 | Station and Facility Visits | 33 |
| 3.8 | Proposer Due Diligence and Investigation | 34 |
| 3.9 | Professional Advice | 34 |
| 3.10 | Individual Meetings | 34 |
| 3.11 | Comments to the RFP or Draft Project Agreement | 35 |
| 3.12 | Proposed Changes to the Terms of the RFP or Draft Project Agreement | 35 |
| 3.13 | Changes to the RFP or Draft Project Agreement | 36 |
| 3.14 | Request for Proposals Addenda | 36 |
| 3.15 | Selection Committee | 36 |
| 3.16 | Proposal Submittal, Evaluation and Award | 37 |
| 3.17 | Best Value Determination | 37 |
| 3.18 | Negotiation of the Project Agreement with the Selected Proposer | 37 |
| 3.19 | Early Works Agreement | 38 |
| 3.20 | Forfeiture of Proposal Letter(s) of Credit | 38 |
| 3.21 | Stipend for Unsuccessful Proposers | 38 |
| 3.22 | Confidentiality | 39 |
| 3.23 | Debriefings | 40 |
| 3.24 | Ownership of Proposal Materials | 41 |
| 3.25 | Proposer Teams | 41 |
| 3.25.1 | Proposer Team Members | 41 |
| 3.25.2 | Relationship Disclosure and Review Process | 41 |
| 3.25.3 | Changes to Proposer Teams | 42 |
| 4. | Proposal Requirements | 43 |
| 4.1 | Overview of Proposal Submittal Requirements | 43 |
| 4.2 | Proposal Deadline and Packaging of Proposals | 43 |

Massachusetts Bay Transportation Authority

| | | |
|-------|--|----|
| 4.2.1 | Date, Time and Location of Receipt | 43 |
| 4.2.2 | Number of Copies and Packaging of Proposals | 44 |
| 4.3 | Proposal Content | 44 |
| 4.3.1 | Proposal Volumes | 44 |
| 4.3.2 | Required Forms | 45 |
| 4.4 | Proposal Format | 45 |
| 4.5 | Limitations on Withdrawal or Modification of a Proposal | 46 |
| 4.5.1 | Modification of Proposals | 46 |
| 4.5.2 | Withdrawal of Proposals | 46 |
| 5. | Proposal Evaluation | 46 |
| 5.1 | Responsiveness Review of Technical Proposals | 46 |
| 5.2 | Evaluation of Technical Proposals | 47 |
| 5.2.1 | Technical Scoring | 47 |
| 5.2.2 | Weighting of Technical Evaluation Topics | 48 |
| 5.2.3 | Technical Proposal Evaluation Criteria | 50 |
| 5.3 | Responsiveness Review of Financial Proposals | 50 |
| 5.4 | Price Proposal Scoring | 51 |
| 5.5 | Ratings Guidelines for the Technical Proposals and Overall Scoring | 52 |
| 5.5.1 | Ratings Guidelines for the Technical Proposals | 52 |
| 5.5.2 | Computing Final Proposal Score | 53 |
| 5.5.3 | Revenue Forecasts | 53 |
| 5.6 | MBTA Requests for Clarification | 53 |
| 5.7 | Presentations and Interviews | 54 |
| 6. | MBTA Rights and Protest Procedures | 55 |
| 6.1 | MBTA Rights and Disclaimers | 55 |
| 6.1.1 | MBTA Rights | 55 |
| 6.1.2 | MBTA Disclaimers | 57 |
| 6.2 | Protests | 58 |

Schedules

- Schedule A – Proposal Submittal Requirements
- Schedule B – Reserved
- Schedule C – Technical Requirements

Massachusetts Bay Transportation Authority

- Schedule D – Draft Project Agreement
- Schedule E – Background Documents
- Schedule F – Master Submittals List

Proposal Forms

- Proposal Form 1A – Technical Proposal Transmittal Letter
- Proposal Form 1B – Financial Proposal Transmittal Letter
- Proposal Form 2 – Proposer Team Member List
- Proposal Form 3 – New Key Personnel
- Proposal Form 4 – New Proposer Team Members
- Proposal Form 5 – Relationship Disclosure Form
- Proposal Form 6 – Statement of Ownership
- Proposal Form 7 – Form of Commitment of Equity Members, Major Non-Equity Members, Project Contractors, Subcontractors and Key Personnel
- Proposal Form 8 – Form of Proposal Letter of Credit
- Proposal Form 9A – Reserved
- Proposal Form 9B – Reserved
- Proposal Form 10 – Insurance Letter of Intent
- Proposal Form 11 – Guarantor Acknowledgment
- Proposal Form 12 – Project Agreement Comments Form
- Proposal Form 13 – Financial Proposal
- Proposal Form 14 – Financial Plan
- Proposal Form 15 – State Certifications
- Proposal Form 16 – Security Certification
- Proposal Form 17 – Security Sensitive Information – Non-Disclosure and Confidentiality Agreement
- Proposal Form 18 – Security Sensitive Information – Certification and Conditions of Custody
- Proposal Form 19 – Stipend Agreement
- Proposal Form 20 – Form of Early Works Agreement

Massachusetts Bay Transportation Authority

- Proposal Form 20A – Commitment to Enter into Early Works Agreement
- Proposal Form 21 – Reference Projects
- Proposal Form 22 – Equipment Price Catalogue

1. Introduction

1.1 Request for Proposals

The Massachusetts Bay Transportation Authority (MBTA) is issuing this Request for Proposals (RFP) to solicit competitive Proposals from those Respondents on the Short-List for the design, implementation, integration, testing, financing, operations, maintenance and management services (the Contract Services) necessary to implement the System. The MBTA expects to enter into a long-term agreement (the Project Agreement) with a single entity (the Systems Integrator) for the performance of all Contract Services necessary for the System, with the DB Installation Work to be procured and contracted for separately by the MBTA.

This RFP invites Proposers to submit Proposals describing their technical and financial proposals for the Project. Proposals will only be accepted from Proposers intending to provide all of the Contract Services through a combination of self-performance and by subcontracting with appropriately qualified firms. Proposals from individual firms not intending to provide all Contract Services will not be accepted.

1.2 Eligibility to Participate in this RFP

The MBTA issued a Request for Qualifications (RFQ), RFQ No. 88-16, and Short-Listed the following Respondents to receive this RFP:

- (1) Cubic – John Laing
- (2) Next Generation Fare Management
- (3) Greater Boston Mobility Partners
- (4) Scheidt & Bachmann USA, Inc.

Only the Respondents on the Short-List are eligible to submit a Proposal in response to this RFP. Any Respondent on the Short-List eligible to receive this RFP who prepares and submits a Proposal will be evaluated as a possible candidate for award of the Project Agreement.

1.3 Structure of this RFP

This RFP includes this document and the following schedules and Proposal forms:

Schedules

- Schedule A – Proposal Submittal Requirements
- Schedule B – Reserved
- Schedule C – Technical Requirements
- Schedule D – Draft Project Agreement
- Schedule E – Background Documents
- Schedule F – Master Submittals List

Massachusetts Bay Transportation Authority

Proposal Forms

- Proposal Form 1A – Technical Proposal Transmittal Letter
- Proposal Form 1B – Financial Proposal Transmittal Letter
- Proposal Form 2 – Proposer Team Member List
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- Proposal Form 4 – New Proposer Team Members
- Proposal Form 5 – Relationship Disclosure Form
- Proposal Form 6 – Statement of Ownership
- Proposal Form 7 – Form of Commitment of Equity Members, Major Non-Equity Members, Project Contractors, Subcontractors and Key Personnel
- Proposal Form 8 – Form of Proposal Letter of Credit
- Proposal Form 9A – Reserved
- Proposal Form 9B – Reserved
- Proposal Form 10 – Insurance Letter of Intent
- Proposal Form 11 – Guarantor Acknowledgment
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- Proposal Form 14 – Financial Plan
- Proposal Form 15 – State Certifications
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- Proposal Form 19 – Stipend Agreement
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- Proposal Form 21 – Reference Projects
- Proposal Form 22 – Equipment Price Catalogue

Massachusetts Bay Transportation Authority

To the extent that this RFP contains information or instructions in addition to, different from, or inconsistent or conflicting with, the equivalent information and instructions set out in the RFQ, this RFP shall govern. This RFP does not constitute an offer to contract with a Proposer or an offer of employment.

1.4 Glossary

1.4.1 Abbreviations

| | |
|------|--|
| ADA | Americans with Disabilities Act |
| CFO | Chief Financial Officer |
| COTS | Commercial Off-The-Shelf |
| CPA | Certified Public Accountant |
| DB | Design-Build |
| EEO | Equal Employment Opportunity |
| FY | Fiscal Year |
| GAAP | Generally Accepted Accounting Principles |
| JV | Joint Venture |
| LLC | Limited Liability Company |
| MBTA | Massachusetts Bay Transportation Authority |
| MOU | Memorandum of Understanding |
| NTP | Notice to Proceed |
| RFP | Request for Proposals |
| RFQ | Request for Qualifications |
| SEC | Securities and Exchange Commission |
| SOQ | Statement of Qualifications |
| US | United States |

1.4.2 Definition of Terms

“**Addenda**” means supplemental additions, deletions, and modifications to the provisions of the RFP after the advertisement date of the RFP.

“**Availability Payments**” means the payments made to the Systems Integrator for the performance of the Contract Services.

“**Background Documents**” means the background documents relevant to the Project, which are listed in Schedule E.

“**Benchmark Interest Rate Date**” means the date for which the Benchmark Interest Rates were observed as provided in Section 2.7.4.1 of the RFP.

“**Bid Equity IRR**” means the Equity IRR as of the Financial Proposal Submission Date based on the Bid Financial Model”

Massachusetts Bay Transportation Authority

“Bid Financial Model” means the financial model included in the Financial Proposal as required by Section 3-20 of Schedule A. This financial model shall form the basis of the Preliminary Financial Model delivered by the Systems Integrator as of the Effective Date.

“Clarifications” means a written exchange of information that takes place between a Proposer and the MBTA after the receipt of Proposals. The purpose of Clarifications is to address ambiguities, omissions, errors or mistakes, and clerical revisions in a Proposal as part of the evaluation process.

“Commercial Close” means the date established as the Effective Date under the Draft Project Agreement.

“Consultant Support Team” means the entities identified in Section 2.17 of this RFP.

“Contract Services” means all services, including, without limitation, the furnishing of all labor, materials, equipment, hardware, software, supervision and other incidentals, required to design, implement, integrate, test, finance, operate, maintain and manage the System, as specified in the Project Agreement.

“Draft Project Agreement” means the Draft Project Agreement provided in Schedule D, as further described in Section 2.4.2 of this RFP. Upon execution, the “Draft Project Agreement” shall become the “Project Agreement.”

“Equity Member” means a member of the Proposer Team that is (a) if the Proposer is a joint venture, a member of the joint venture, (b) if the Proposer is a newly formed limited liability entity, an equity owner of the Proposer or (c) if the Proposer is a corporation or other entity that is not newly formed, the Proposer.

“Fare Card” means a closed loop transportation payment card to be provided to transportation customers as an alternative to the use of contactless credit or debit cards and payment enabled phones for executing fare transactions.

“Firmex” means the online data room which contains the RFP, Draft Project Agreement, Background Documents and other materials relating to this procurement.

“Financial Key Personnel” means the financial key personnel identified in the Proposer’s SOQ and any new financial key personnel identified on Proposal Form 3.

“Financial Proposal Submittal Date” means the date set forth in Section 3.3.1 of this RFP by which the Financial Proposals must be submitted.

“Guarantor” means an entity that will irrevocably and unconditionally guarantee a Major Non-Equity Member’s payment and performance obligations under the applicable Project Contract.

“Individual Meetings” means the Proposer’s periodic meetings with the MBTA and members of its Consultant Support Team, as further described in Section 3.10 of this RFP.

Massachusetts Bay Transportation Authority

“**Key Personnel**” means the Financial Key Personnel and Technical Key Personnel.

“**Lead Design and Installation Firm**” means the firm that the Proposer is proposing to serve as the lead designer and installer of the System.

“**Lead Operating Firm**” means the firm that the Proposer is proposing to serve as the lead operator of the System.

“**Major Non-Equity Member**” means the Proposer’s proposed Lead Design and Installation Firm and Lead Operating Firm, in each case, to the extent they are not Equity Members.

“**Massachusetts Bay Transportation Authority**” or “**MBTA**” means the authority created in 1964 by an act of the Massachusetts General Court, operating under and empowered by Chapter 161A of the General Laws. Among other things, the MBTA is empowered to provide public transportation services, including the Project, either directly or by contract.

“**Point of Contact**” has the meaning specified in Section 3.4.1 of this RFP.

“**Project**” means the System and the Contract Services.

“**Project Agreement**” means the written agreement between the MBTA and the Systems Integrator setting forth the obligations of the parties in respect of the Project, including, but not limited to, the performance of the Contract Services.

“**Proposer Team**” means the Proposer, each Equity Member, any Guarantor, each Major Non-Equity Member, each Key Personnel and any other contractor or subcontractor identified by the Respondent in its SOQ and in Proposal Forms 3 and 4.

“**Proposal**” means the offer (in response to this RFP) of a Proposer for the performance of the Project Agreement, when executed and submitted in the prescribed format and on the prescribed forms.

“**Proposal Submittal Date**” means the Technical Proposal Submittal Date or the Financial Proposal Submittal Date, as applicable.

“**Proposer**” means the single legal entity or the consortium, partnership, joint venture or any other unincorporated grouping submitting a Proposal in response to this RFP.

“**Request for Proposals**” or “**RFP**” means this written solicitation issued by the MBTA seeking Proposals to be used to identify the Proposer offering the best value to the MBTA.

“**Request for Qualifications**” or “**RFQ**” means the written solicitation issued by the MBTA which sought SOQs, which SOQs were used to identify and short-list the most highly qualified Respondents to receive this RFP.

“**Respondent**” means the named interested party that submitted an SOQ in response to the RFQ.

“**Selected Proposer**” means the Proposer determined to offer the best value to the MBTA in accordance with this RFP and recommended for award of the Project Agreement.

“**Short-List**” means the list of those Respondents that submitted SOQs that the MBTA determined, through evaluation of the SOQs in accordance with the RFQ, were the most highly qualified Respondents and that are invited to submit Proposals in response to this RFP.

“**State Certifications and Assurances**” has the meaning set out in Section 2.14.1 of this RFP.

“**Statement of Qualifications**” or “**SOQ**” means the information prepared and submitted by a Respondent in response to the RFQ for the purpose of seeking to be included on the Short-List, when executed and submitted in the prescribed format and on the prescribed forms.

“**System**” means the automated, account-based open fare collection system to be described in detail in the Project Agreement, including all associated hardware and software.

“**Systems Integrator**” means the Selected Proposer or an entity formed by the Selected Proposer for purposes of entering into the Project Agreement with the MBTA.

“**Technical Key Personnel**” means the technical key personnel identified in the Proposer’s SOQ and any new financial key personnel identified on Proposal Form 3.

“**Technical Proposal Submittal Date**” means the date set forth in Section 3.3.1 of this RFP by which the Technical Proposals must be submitted.

“**Technically Unacceptable**” means a responsive Technical Proposal which receives a score of zero for any of the technical evaluation topics or a score of one for more than four of the technical evaluation topics identified in Section 5.2.3 of this RFP. Proposals which are Technically Unacceptable shall be eligible for the stipend payment but shall not be eligible for award of the Project Agreement.

Terms that are capitalized in this RFP but not defined above have the meaning set forth in Appendix 1 to the Draft Project Agreement.

2. Project Overview

2.1 Background

The issuance of this RFP is the second step in a two-step procurement process being undertaken by the MBTA pursuant to the powers granted to it under its enabling legislation at Chapter 161A of the Massachusetts General Laws. The MBTA’s intent in developing this RFP is to encourage Proposers to provide the best solution for the Project consistent with the MBTA’s procurement and contract goals identified in Sections 2.3 and 3.1 of this RFP and the Technical Requirements set forth in Schedule C.

No federal funds are to be used in connection with the issuance of this RFP or in the Project Agreement that will be entered into with the Selected Proposer.

2.2 Project Description

The primary transportation payment medium in Eastern Massachusetts today is the MBTA CharlieCard (a smart card that stores certain passes or value) and, to a lesser extent, the MBTA CharlieTicket (a magnetic stripe ticket that stores certain passes or value). The CharlieCard and CharlieTicket support the current bus and subway fare policy: a flat single ride fare, free or reduced fare transfers for subway/bus and bus/bus linked trips, time-based passes, and a reduced fare program for senior citizens, persons with qualifying disabilities and students. The MBTA's current fare collections system is limited in its ability to support a robust set of fare policies for public transportation and does not provide for a single, seamless public transportation experience, as payment methods vary among differing transportation services.

The System is intended to replace the MBTA's current fare collections system to provide for an integrated, reliable and convenient fare payment and collection system to enable transportation customers to pay fares by tapping contactless bank cards, mobile phones and Fare Cards across the entire set of Transportation Services. This new account-based System will support implementation of a robust set of fare policy options for the MBTA, improve operational conditions, increase the security of transactions, and improve revenue control for the MBTA.

2.3 Project Goals

The specific objectives for the Project are as follows:

- A) **Fare Policy.** Support a robust set of fare policies for public transportation, including flat fares, distance-based or zone fares, time of day and day of week fares, free or paid transfers, multiple fare types (disability, senior, student and other), single trips and passes, joint fares across carriers, and best value fares.
- B) **Fare collection.** Support multiple fare collection methods for public transportation, including gates (with tap on and, if specified, tap off), vehicle-based fare collection (including multiple-door boarding and alighting), and platform validators (typically used in commuter rail).
- C) **Integration.** Support integrated fare policies and functionality across multiple agencies, modes, carriers, and services, including revenue settlements, joint fares and passes, and support the inclusion of private transportation carriers and non-transit operators.
- D) **Payment media.** Support for multiple payment devices such as payment-enabled mobile phones and contactless credit and debit cards that are carried by riders and provide payment media accessible to all users, including the creation of a network of reload locations where Users may add value or purchase passes.
- E) **Customer service.** Provide web and mobile software applications and an interactive voice response phone system to support payments, transaction history and account management for users (including allowing account self-service,

Massachusetts Bay Transportation Authority

simplified purchase options and processes) and to support MBTA call center-assisted intervention.

- F) **Equity.** Support for payment means and compliance with MBTA policies and applicable laws and regulations to ensure that the System meets the needs of and provides increased accessibility to low-income, minority, and other disadvantaged groups, including universal access to payment media that provide the lowest price, best value pricing, fare integration with commuter rail, and other initiatives.
- G) **Accessibility.** Ensure that the System complies with MBTA policies and meets or exceeds the accessibility requirements established by applicable law by providing improved access to System devices, including fare vending machines, validators and fare gates, and points of sale, and configuring the System in a manner which assists users with cognitive and physical impairments.
- H) **Revenue control.** Provide fully reconciled, auditable and accurate revenue deposits and reports to support verification of ridership, revenues, and revenue collection costs and processes, as well as efficient cash servicing and management, including secure and efficient cash handling, accounting, reconciliation and deposit.
- I) **Security and privacy.** Provide a secure communications networks to exchange data among all devices and locations, provide for secure transactions with payment media, servers and payments processing, and maintain customer privacy and data security.
- J) **Configuration and operational flexibility.** Provide for the ability to change fares, add or change agencies and carriers, add or change fare collection equipment or otherwise configure or change the System's operation, or an element of the System's operation, in an efficient and timely manner, reducing the level of staff time required for implementation of changes.
- K) **Cost reduction.** Provide fare collection design and operations solutions which result in greater operational efficiencies, thereby reducing the system-wide cost of fare collection.
- L) **Control of fare evasion.** Provide for accurate calculation of fares and efficient processing of taps and credentials, blocking of accounts, control of all-door boarding and alighting in respect of vehicle-based fare collection, and support for inspection devices for fare payment enforcement to reduce the amount of uncollected fares, missed fares, and fare evasion.
- M) **Fraud prevention.** Monitor and manage taps, transactions, accounts and funds to detect and prevent fraudulent activities.

- N) **Ridership and revenue data analytics.** Provide for all System data in a standard, easily-usable database format for analysis.
- O) **Operational improvements.** Reduce boarding times for bus and light rail services and conductor collection times of commuter rail fares.

The MBTA is seeking a Systems Integrator capable of bringing together a wide array of services, components and user interfaces to create a functioning System that will meet these objectives and establish the foundation for interoperability of fare payment systems among the MBTA and other regional transportation entities, including private carriers.

2.4 Scope of the Contract Services

2.4.1 Responsibilities of the Systems Integrator

The Systems Integrator will be responsible for delivering the System and performing the Contract Services. As further described in the Draft Project Agreement, the Contract Services include but are not limited to:

- A) Design and implementation of the System, including design of all hardware and software, to enable transit riders to pay fares using contactless bank cards, mobile phones, and Fare Cards and that is installable, diagnosable and replaceable with COTS equipment and industry-typical technological skills, and capable of performing the program requirements;
- B) Development and implementation of a Project plan detailing the Systems Integrator's organizational approach, the software and hardware elements of the System, the Project schedule, and the Systems Integrator's approach to ensuring network and power availability to support performance;
- C) Securing all necessary licenses and rights with respect to System intellectual property;
- D) Financing all costs necessary for the performance of the Contract Services (excluding the DB Installation Work), which financing will be secured primarily by Availability Payments commencing with System operations;
- E) Compliance with all specifications and installation requirements, including limitations on modifications to MBTA equipment and facilities, power supply requirements, tamper resistance requirements, emissions requirements, flammability requirements, and GPS support;
- F) System integration, testing and implementation to provide for a smooth transition from the MBTA's existing fare collections system and achieve a state of full System operations within a guaranteed completion schedule;

Massachusetts Bay Transportation Authority

- G) Developing the DB Plans and Specifications and coordinating all work with the DB Entity and monitoring the performance of the DB Installation Work for acceptance by the Systems Integrator;
- H) Removal of the existing fare collections system, as required, upon transition to full System operations, excluding removal work within the scope of the DB Installation Work;
- I) Administration, reporting, and billing associated with the System, including all duties related to revenue accounting, fare transactions, recordkeeping, office management, payroll, and human resources;
- J) Providing for the manufacture, supply, distribution and sale of Fare Cards in a manner that provides equal, ready and easy access for all transit riders;
- K) Cash servicing and management in respect of the sale of Fare Cards, including secure and efficient cash handling, accounting, reconciliation, deposit, as well as collection and transport of cash from fare vending machines;
- L) Execution and monitoring of System transactions, settlements, chargebacks, cash servicing, counting, reconciliation, management, deposit and other processes related to cash management;
- M) Providing for secure fare transactions and maintaining customer privacy and data security;
- N) Providing for calculations, records and reports concerning the apportionment of fares collected and the distribution among the MBTA and any other participating transportation entities;
- O) Database management to enable MBTA analysis of all System data;
- P) Compliance with operational reliability standards and key performance indicators over the term of the Project Agreement;
- Q) Development and implementation of an equal employment opportunity and affirmative action program to ensure that all employees and applicants are treated without regard to their race, color, religion, creed, ancestry, gender, national origin, ethnicity, age, disability, sexual orientation, genetic status, gender identity or expression, veteran status (including Vietnam-era veterans) or background; and
- R) Operations and maintenance of the System for a term of approximately 11 years, depending upon the achievement of the Revenue Service Commencement Date, (with MBTA options for two five-year extensions), including maintenance of all System hardware and software.

Except as provided in the Draft Project Agreement, the Systems Integrator's sole compensation for the performance of the Contract Services will be periodic Availability Payments paid in the manner described in the Draft Project Agreement. Given the performance-based nature of the Project Agreement, the Availability Payments will be made upon a demonstration that the Contract Services have been satisfactorily performed. Further information on the Availability Payment structure, including deductions and incentives, is provided in Appendix 8 to the Draft Project Agreement.

2.4.2 Form of Proposed Project Agreement

A form of the Draft Project Agreement is provided in Schedule D. The Draft Project Agreement sets forth the intended risks, responsibilities and obligations of the Systems Integrator in performing the Contract Services and delivering the System. Proposers are encouraged to provide detailed written comments on any major or significant issues identified in the Draft Project Agreement during the Individual Meeting Process described in Section 3.10 of this RFP. Based on its assessment of comments from all Proposers, the MBTA, in its sole discretion, may make modifications to the Draft Project Agreement and issue Addenda containing such modifications prior to the Technical Proposal Submittal Date. The final Draft Project Agreement will serve as the basis for all Proposals.

2.5 Role of the MBTA

In accordance with the Draft Project Agreement, the responsibilities of the MBTA are expected to include the following:

- A) Establishment of MBTA fare policies to be implemented by the System, including setting fare rates for all MBTA transportation services, determining the sales price of Fare Cards and management of regional fare and customer service policies;
- B) Retention of revenue risk relating to the MBTA transportation network, including the risk and reward of the established fare rates and the sales price and number of Fare Cards sold;
- C) Performing reviews of designs, plans and procedures developed by the Systems Integrator in accordance with the Project Agreement;
- D) Providing access to MBTA stations, vehicles and other property for the performance of System installation, testing, operations and maintenance work by the Systems Integrator in accordance with the Project Agreement;
- E) Performing inspections and reviews of installations and testing performed by the Systems Integrator in accordance with the Project Agreement;
- F) Financing and performing, or causing the performance of, the DB Installation Work, including administration and enforcement of the DB contract;

- G) Call center and walk-in store operations, including staffing and management to handle telecom and in-person requests to resolve fare issues, subject to the software interface and functionality responsibilities of the Systems Integrator;
- H) Staffing and management for administration of employer pass, school and other group fare programs, subject to the interactive voice response and software interface and Fare Card supply responsibilities of the Systems Integrator; and
- I) Making Availability Payments to the Systems Integrator in accordance with the Project Agreement.

2.6 Design and Implementation Considerations

2.6.1 Technical Requirements

The technical requirements and specifications for the System (“Technical Requirements”) are provided in Schedule C. The Technical Requirements will be incorporated into the Appendices to the Project Agreement prior to execution, and the Systems Integrator will be required to design, develop and implement the System in compliance with the Technical Requirements.

The Technical Requirements set forth certain minimum performance-based requirements with which each Proposer must comply. The MBTA encourages innovation in the development of Proposals, and, in providing the Proposers with these minimum performance-based requirements rather than a complete set of detailed technical specifications, believes it has afforded Proposers the flexibility to innovate and develop creative design solutions. As such, the MBTA does not believe that an alternative technical concept process in this RFP is necessary.

2.6.2 DB Installation Work

2.6.2.1 Scope of DB Installation Work

All System installation work at Stations, Stops and all other Locations (excluding Retail Reload Locations, SI Locations and Vehicles) will be included in the DB Installation Work. This includes all physical alteration, construction, reconstruction, remodeling, wiring or electrical services in respect of such Locations, all of which will be included in the scope of the DB Installation Work. The Systems Integrator will not perform any installation work at any Station, Stop or other Location (excluding Retail Reload Locations, SI Locations and Vehicles) which involves reconstruction, physical alteration, construction, remodeling, wiring or electrical services. The DB Installation Work will include:

- a) Installation of all System equipment and all of the necessary wiring, protective devices and mounting hardware necessary for the proper installation and operation of the equipment;
- b) Removal work associated with the existing system to the extent such work takes place at a Station, Stop or other Location (excluding Retail Reload Locations, SI

Locations and Vehicles), including the removal or refurbishment of fare gates, the removal of vending machines, the removal of other physical components of the existing system and the installation of platform validators, fare gates and vending machines;

- c) Performance of physical work relating to the modifications required to prepare any Station, Stop or other Location (excluding Retail Reload Locations, SI Locations and Vehicles) to accept the System, including site preparation;
- d) Procurement of all materials, labor and equipment necessary for installation (including handrails and other materials and equipment necessary for passengers and operators to use the System), excluding the System Elements which will be procured by the Systems Integrator and provided to the MBTA or the DB Entity in accordance with the Project Agreement;
- e) Performance of functional testing necessary to demonstrate that the DB Installation Work has been properly completed and enable the Systems Integrator to accept the work at each stage following thorough inspection; and
- f) Removal of existing equipment upon notice from the MBTA and coordination with the Systems Integrator.

The DB Installation Work will be completed in stages, as approvals are obtained and concurrently with further plans and specifications development for other stages or elements of the DB Installation Work.

2.6.2.2 Responsibilities of the DB Entity

Pursuant to the terms of the DB Contract and subject to the rights of the MBTA under the Project Agreement, the DB Entity will be responsible for:

- a) Completion of detailed specifications and detailed plans for the DB Installation Work;
- b) Attending of meetings with, and responding to comments received from, the Systems Integrator and the MBTA in order to secure the MBTA's and the Systems Integrator's approval of the plans and specifications;
- c) Obtaining of approvals required for physical installation, including any MBTA approvals and approvals from other Governmental Bodies;
- d) Coordination with the Systems Integrator and the MBTA during physical installation, including complying with reporting requirements (periodic reports, meetings, etc.) and enabling representatives of the Systems Integrator and the MBTA to be present during performance of the DB Installation Work (including design and engineering staff and station oversight management staff);

- e) Correction of any defects identified through such functional testing or otherwise by the Systems Integrator;
- f) Upon acceptance by the Systems Integrator, transfer of control to the Systems Integrator for System testing in accordance with the terms of the Project Agreement; and
- g) Providing a warranty for the completed DB Installation Work for an agreed-upon period, which warranty may be assigned from the MBTA to the Systems Integrator.

2.6.2.3 Exclusions to the Scope of the DB Installation Work

The DB Installation Work will not include, and the Systems Integrator will be responsible for:

- a) Identification, manufacturing and procurement of System equipment;
- b) Equipment installation or removal work within MBTA vehicles;
- c) Design decisions associated with the System, including the design for the functionality and performance of fare gates, readers, validators and vending machines, as well as determining whether to replace or refurbish existing gates and the number and general location of validators and vending machines;
- d) Furnishing of all System Elements necessary for the performance of the DB Installation Work;
- e) Installation of equipment provided to sales outlets or other authorized Retail Reload locations for the sale of Fare Cards and Products;
- f) Installation, configuration and activation of network monitoring software to manage and monitor the System and its components;
- g) Calibration and configuration of equipment; and
- h) Installation of software and computer hardware components, except that all wiring and electrical services relating to such installation shall be performed as part of the DB Installation Work.

The Systems Integrator will be responsible for the monitoring of the DB Installation Work in accordance with the Project Agreement. As described above, the Systems Integrator shall not be responsible for any installation, physical alteration, wiring and electrical services, and remodeling work performed at any Station, Stop or other Location (excluding Retail Reload Locations, SI Locations and Vehicles).

2.6.2.4 DB Entity Procurement

The MBTA will separately procure and contract with the DB Entity for the performance of the DB Installation Work. The MBTA anticipates that the RFP for the DB Entity will be issued

prior to determination of the Selected Proposer and will provide Proposers with the opportunity to review and comment on the RFP and draft DB Contract to the extent practicable. Ultimately, it is the MBTA's responsibility under the Project Agreement to provide for the performance of the DB Installation Work in accordance with the DB Plans and Specifications.

2.6.2.5 Proposal Requirements

Proposals shall include the Proposer's proposed System design decisions, including decisions regarding the design for the functionality and performance of fare gates, readers, validators and vending machines, as well as determining whether to replace or refurbish existing gates and the number and general location of validators and vending machines.

Proposers shall also propose their plans for the performance of all System installation work, including the DB Installation Work, which plans must demonstrate an understanding of the MBTA's policies regarding System accessibility and meet all applicable Technical Requirements. Proposers' plans for the DB Installation Work, the Preliminary DB Plans and Specifications, shall comply with the requirements set forth in Appendix 2.13 of Schedule C.

Proposers are not required to include in their Financial Proposals their proposed price for the performance of the DB Installation Work. However, Proposers will be evaluated on the anticipated cost impact of their plans and specifications for the DB Installation Work through the technical scoring process, as further described in Appendix 2.13 of Schedule C.

The Systems Integrator's rights and responsibilities in respect of the DB Installation Work will be as set forth in the Project Agreement. Proposers may not propose a structure under which the DB Entity would be a subcontractor to the Systems Integrator.

2.7 Committed Financing

2.7.1 Private Financing of the Project

Except as provided in Section 2.7.3 of this RFP, the Systems Integrator will be solely responsible for obtaining and repaying all financing necessary for the Project at its own cost and risk and without recourse to the MBTA. All debt or other obligations issued or incurred by the Systems Integrator in connection with the Project Agreement will be issued or incurred only in the name of the Systems Integrator. The MBTA shall have no obligation to pay debt service on any such debt or other obligations, or to join in, execute or guarantee any note of other evidence of indebtedness of the Systems Integrator.

The Selected Proposer's obligation to achieve commercial close in accordance with its Financial Plan will be secured by Proposal Letter(s) of Credit, and the Selected Proposer's obligation to achieve financial close in accordance with its Financial Plan will be secured by the Financial Close Security. The Draft Project Agreement anticipates that Commercial Close will occur prior to Financial Close. If Commercial Close and Financial Close occur at the same time, the MBTA will return the Proposal Letter(s) of Credit to the Selected Proposer upon satisfaction of all Financial Close Conditions. If Commercial Close occurs prior to Financial

Massachusetts Bay Transportation Authority

Close, the Systems Integrator will be required to provide the Financial Close Security (which will replace the Proposal Letter(s) of Credit) and to achieve Financial Close, all in accordance with the Project Agreement. In such event, the Proposal Letter(s) of Credit will be returned to the Selected Proposer upon delivery of the Financial Close Security. The conditions for achieving Financial Close are set forth in Appendix 14 to the Draft Project Agreement.

2.7.2 Plan of Financing

Each Financial Plan shall demonstrate that the Proposer has the capacity to finance the Project from design and implementation through the end of the Term. Proposers must provide a full description of a complete financing plan for the Project Agreement, including the sources and uses of financing. The Financial Plan shall also indicate that the financing is committed.

Each Financial Plan shall comply with the requirements set forth in Schedule A.

2.7.3 Financing the DB Installation Work

The MBTA will directly finance the DB Installation Work. As described in Section 2.6.2.5 of this RFP, Proposers are required to prepare the plans and specifications for the DB Installation Work but are not required to include pricing for the DB Installation Work in their Proposals.

2.7.4 Interest Rate Risk

2.7.4.1 Benchmark Interest Rate Risk

The MBTA will assume the risk and reward of movements in Benchmark Interest Rates between those included in the Financial Proposal and those at Financial Close subject to the terms and conditions of the Project Agreement. To the extent that Benchmark Interest Rates fluctuate between those provided by the MBTA for use within the Financial Proposal and those at Financial Close, the Preliminary Financial Model will be updated to reflect the Benchmark Interest Rates at Financial Close and the impact will be reflected in an adjustment to the lowest APC that maintains all lenders' requirements and the Systems Integrator's Preliminary Equity IRR. The Benchmark Interest Rate(s) applicable at Financial Close will be independently verified by the MBTA using independently verifiable sources acceptable to the MBTA, as appropriate.

The MBTA will provide Benchmark Interest Rate protection to Proposers based on the below indices only.

The Benchmark Interest Rates are:

| Maturity | US\$ 1 Month vs. US\$ 3 Month LIBOR Swap Yield | Maturity | US\$ 3 month LIBOR Swap Yield | Maturity | Overnight Index Swap Yield | Maturity | US Treasury Yield Curve |
|----------|--|----------|-------------------------------|----------|----------------------------|----------|-------------------------|
| 3M-Basis | 7.08000 | 1M | 1.238 | 1D | 1.16000 | 1M | 1.002 |
| 6M-Basis | 7.37500 | 3M | 1.347 | 1W | 1.16000 | 3M | 1.074 |

Massachusetts Bay Transportation Authority

| Maturity | US\$ 1 Month vs. US\$ 3 Month LIBOR Swap Yield | Maturity | US\$ 3 month LIBOR Swap Yield | Maturity | Overnight Index Swap Yield | Maturity | US Treasury Yield Curve |
|-----------|--|----------|-------------------------------|----------|----------------------------|----------|-------------------------|
| 9M-Basis | 7.75000 | 6M | 1.480 | 2W | 1.16025 | 6M | 1.223 |
| 1Y-Basis | 7.68750 | EDZ7* | 1.520 | 3W | 1.15700 | 1Y | 1.339 |
| 18M-Basis | 8.62500 | EDH8* | 1.650 | 1M | 1.15800 | 2Y | 1.513 |
| 2Y-Basis | 9.12500 | EDM8* | 1.760 | 2M | 1.15900 | 3Y | 1.656 |
| 3Y-Basis | 9.12500 | EDU8* | 1.840 | 3M | 1.21700 | 4Y | 1.857 |
| 4Y-Basis | 9.12500 | EDZ8* | 1.930 | 4M | 1.25500 | 5Y | 1.979 |
| 5Y-Basis | 8.87500 | EDH9* | 1.980 | 5M | 1.27650 | 6Y | 2.114 |
| 6Y-Basis | 8.60000 | 1Y | 1.616 | 6M | 1.30100 | 7Y | 2.211 |
| 7Y-Basis | 8.35000 | 2Y | 1.787 | 9M | 1.36500 | 8Y | 2.285 |
| 10Y-Basis | 7.68750 | 3Y | 1.904 | 12M | 1.41700 | 9Y | 2.341 |
| 12Y-Basis | 7.37500 | 4Y | 1.990 | 18M | 1.50200 | 10Y | 2.377 |
| 15Y-Basis | 7.40000 | 5Y | 2.063 | 2Y | 1.56500 | 15Y | 2.442 |
| 20Y-Basis | 7.87500 | 6Y | 2.132 | 3Y | 1.66300 | 20Y | 2.646 |
| 25Y-Basis | 8.00000 | 7Y | 2.194 | 4Y | 1.73100 | 25Y | 2.859 |
| 30Y-Bais | 8.74500 | 8Y | 2.250 | 5Y | 1.79400 | 30Y | 2.902 |
| | | 9Y | 2.299 | 6Y | 1.8556 | | |
| | | 10Y | 2.344 | 7Y | 1.8996 | | |
| | | 11Y | 2.382 | 8Y | 1.9516 | | |
| | | 12Y | 2.418 | 9Y | 1.9914 | | |
| | | 15Y | 2.492 | 10Y | 2.0233 | | |
| | | 20Y | 2.562 | 11Y | 2.0578 | | |
| | | 25Y | 2.590 | 12Y | 2.0864 | | |
| | | 30Y | 2.599 | 15Y | 2.1455 | | |
| | | | | 20Y | 2.2015 | | |
| | | | | 25Y | 2.2208 | | |
| | | | | 30Y | 2.2237 | | |
| Date | 10/06/2017 | Date | 10/06/2017 | Date | 10/06/2017 | Date | 10/06/2017 |

Note: * At financial close, then-current applicable Eurodollar futures contracts will be used for Benchmark Interest Rate adjustment. Relevant day count adjustments will be made to ensure that benchmarks without a constant maturity are adequately considered.

2.7.4.2 Credit Spread Risk

The MBTA believes that there is sufficient market capacity for Proposers to obtain committed pricing related to credit spreads for both Bank Debt and Bonds and therefore will not provide any protection associated with credit spread risk.

2.7.5 Allocation of Costs between APC, APO and APT

Proposers are required to allocate certain costs to each of the APC, APO and APT payment streams. It is understood that there may not be an exact match in every period, but over the term the underlying costs will substantially align to the following principles.

2.7.5.1 APC

APC is to provide for repayment of financing costs on all debt and equity required for the delivery of the capital-related aspects of the Implementation Period.

APC is required to be used for:

- payment of principal and interest due under the Financing Documents (including any payments or receipts under any Hedging Arrangements), and
- payment of any Distribution.

APC may be used, but is not required to be used, for:

- funding of any reserves required to be in place prior to the Full Service Commencement Date,
- the funding of any reserves required by the Financing Documents throughout the Term,
- any other requirements during the Implementation Period that arise prior to Revenue Service, including Operating Services in respect of the Pilots; and
- Operating Services expenses prior to the Full Service Commencement Date to the extent that due to the ramp-up of APO prior to the Full Service Commencement Date, APO is not sufficient to meet the Systems Integrator's Operating Services obligations in advance of the Full Service Commencement Date.

2.7.5.2 APO

APO is to provide for all other costs not captured within either APC or APT, and particularly (except as noted in Section 2.7.5.1), all costs associated with the Operating Services. Beginning on the Revenue Service Commencement Date to the end of the Term. This includes the funding of certain reserves and any additional funding to reserves that is necessary during the Operating Period.

2.7.5.3 APT

APT is to provide for all variable costs (excluding Eligible Subtractions from Fare Revenue) related to the purchase of Products or adding Value to User and Integrated Service Accounts via one or more of the Transaction Channels. APT is made up of two constituent parts: Allowable AP Transaction Rate and Other AP Transaction Rate. The Total AP Transaction Rate is the sum of the Allowable AP Transaction Rate and the Other AP Transaction Rate.

The Allowable AP Transaction Rate is subject to periodic adjustment for movement in market pricing for provision of the services pursuant to Section 6 of Appendix 8. Only those items

explicitly included in the definition of the Allowable AP Transaction Fees are eligible for inclusion and periodic adjustment. For the avoidance of doubt, the Allowable AP Transaction Rate is not to include any Systems Integrator contingency or profit. Prior to Financial Close, the Systems Integrator shall be required to submit into escrow all necessary documents, agreements and calculations to support the basis of the Allowable AP Transaction Rate.

The Other AP Transaction Rate is not subject to any adjustment over the Term and is to cover the Systems Integrator for all costs (including contingency and profit) not provided explicitly within Allowable AP Transaction Fees. The Other AP Transaction Rate is intended to allow the Proposer to cover all variable costs that are not part of Allowable AP Transaction Fees or Eligible Subtractions from Fare Revenue. This may include Chargebacks and PAYG Losses or avoidable downgrades the SI may incur which would not be included in Eligible Subtractions from Fare Revenue.

2.7.5.4 Capital Costs Reporting

As the above segregation of costs may not comply with how the MBTA defines capital and operating costs, the Systems Integrator shall be required to support the MBTA in identifying which portion of APC, APO and APT relate to the MBTA's definition of capital vs. operating for budget and reporting purposes.

2.7.6 Financial Model Updates

Proposers are required to submit the Bid Financial Model as part of their Financial Proposal. This model will be adjusted between the Financial Proposal Date and the Effective Date to take account of any changes allowed under the terms of this RFP which may include adjustment to the Financial Close Deadline and associated dates and, in the case of simultaneous Commercial Close and Financial Close, adjustment to APC to account for changes in Benchmark Interest Rates.

The financial model in place as of the Effective Date shall be referred to as the Preliminary Financial Model.

The financial model in place as of the Financial Close Date will be referred to as the Financial Model.

2.7.7 MBTA Termination Compensation Proposal

Proposers shall indicate in their Proposal, as further described in Package 5 to Volume 3 to Schedule A, their election as to whether they will utilize Option A (Bid Financial Model Termination Compensation Option) or Option B (Fair Market Value Termination Compensation Option), as each such option is set forth in Appendix 13 to the Draft Project Agreement. Proposers shall select only one such option to serve as the basis for their Financial Proposal.

2.7.8 Equipment Price Catalogue

Proposers shall include in their Financial Proposals an equipment price catalogue for their Customer-Facing Device subcomponents in the format set forth on Proposal Form 22. The prices listed in the catalogue shall represent the full price (index linked) that the MBTA will be

required to pay in the event that the MBTA wishes to purchase any subcomponents from the Systems Integrator following the Expiration Date.

2.8 Sources of Funds

Information relating to the MBTA budget and the sources of funds that the MBTA anticipates using to fund its payment obligations under the Project Agreement can be found on the MBTA's website and in the Background Documents, particularly in the Background Document titled "Budget and Debt Capacity White Paper."

2.9 Security for Performance and Insurance

2.9.1 Proposal Letter(s) of Credit

Each Proposer shall deliver one or more complete, irrevocable, properly executed standby letters of credit from a financial institution and in favor of the MBTA ("Proposal Letter(s) of Credit"). The Proposal Letter(s) of Credit shall be in an aggregate amount equal to USD \$3 million. The Proposal Letter(s) of Credit shall: (1) be issued or confirmed by a domestic Qualified Commercial Bank or by the Boston, Massachusetts or New York, New York branch or agency of a foreign Qualified Commercial Bank; and (2) be in substantially the form set forth in Proposal Form 8. If, at any time after the Financial Proposal Submittal Date, any issuer of the Proposal Letter(s) of Credit is downgraded by one or more of the rating agencies by more than one ratings category below the ratings required herein, the Proposer shall promptly notify the MBTA in writing of such change and, within 30 days of such notice, the Proposer shall deliver to the MBTA a new letter or letters of credit from a replacement issuer. Upon MBTA's receipt of such replacement letters of credit, the MBTA shall promptly return the replaced Proposal Letter(s) of Credit to the Proposer.

The Proposal Letter(s) of Credit shall secure the Proposer's obligations, if selected, to negotiate the terms and conditions of the Project Agreement in good faith and, if selected, to achieve Commercial Close. The MBTA shall be entitled to draw on the Proposal Letter(s) of Credit only in the circumstances contemplated in Section 3.20.

One original and three copies of the Proposal Letter(s) of Credit shall be provided with the Financial Proposal and shall be in a separate envelope labeled "[Proposer Name]: Proposal Letter of Credit for the MBTA AFC Project."

2.9.2 Security for Performance under the Project Agreement

The Draft Project Agreement sets forth the security for performance requirements in respect of the performance of the Contract Services.

2.9.3 Insurance

The Systems Integrator shall obtain and maintain all Required Insurance in accordance with the Draft Project Agreement. Proposers must obtain coverage from insurance provider(s) that comply with the requirements set forth in the Draft Project Agreement. Proposers may use multiple insurance providers to provide the various types of insurance identified in the Project

Agreement; however, Proposers must use one single insurance provider for each type of insurance.

Proposers shall submit as part of their Financial Proposals an Insurance Letter of Intent on Proposal Form 10, as further described in Section 3-5 of Schedule A, evidencing that the Proposer is capable of providing such Required Insurance. The Insurance Letter of Intent acknowledges, among other things, that the Proposer's insurance provider has reviewed and understands the requirements of this RFP and the Draft Project Agreement and that the insurance provider intends to furnish the Required Insurance set forth in Article 17 of the Project Agreement and Appendix 12 to the Project Agreement, as negotiated between the parties based on this RFP and the Proposal. The Required Insurance must be in place on or before the Financial Close Date, except as provided in the Project Agreement.

2.10 Governmental Approvals

Subject to Section 6.7(C) of the Draft Project Agreement, the Systems Integrator shall be solely responsible for obtaining and maintaining all Governmental Approvals required for the performance of the Contract Services as provided in the Draft Project Agreement. The MBTA will provide reasonable assistance to the Systems Integrator in connection with such obligation; however, such assistance shall be limited in the manner set forth in the Draft Project Agreement.

2.11 Tax Considerations

The laws of the Commonwealth exempt the MBTA from the payment of sales and use taxes related to property that it owns and occupies. The MBTA will provide to the Systems Integrator at the appropriate time a sales tax exemption letter, which the Systems Integrator will be entitled to present to vendors as proof of the application of this exemption to purchases of materials and equipment that become components of the System. The Financial Proposals shall not include sales and use tax for materials and equipment, but shall include all other taxes imposed by Applicable Law.

2.12 System Expansion

Proposers shall include in their Price Proposals pricing for the Planned Expansions listed in Section 2 of Appendix 2.8 of Schedule C and the expansion projects listed in Section 6 of Appendix 2.8 of Schedule C. Further information relating to expansion is provided in Appendix 2.8 of Schedule C and Articles 11 and 12 of the Draft Project Agreement. The MBTA will make available via Firmex the plans and specifications for the Planned Expansions as they are finalized.

Proposers shall also include in their Price Proposals pricing for the items listed in Pro-Forma Table 6 of Proposal Form 14. The MBTA reserves the right to evaluate such pricing as part of the Price Proposal evaluation process. However, the MBTA shall have no obligation to move forward with such unplanned expansions following execution of the Project Agreement

regardless of whether the pricing for such items is evaluated during the Proposal evaluation process.

2.13 Demonstrations and Reference Project Site Visits

2.13.1 Demonstrations

Proposers shall conduct up to two demonstrations for the MBTA of possible technical solutions for the Project, as indicated in the Procurement Schedule set forth in Section 3.3.1 of this RFP, using equipment that Proposers have used on other similar projects. The first demonstration is optional and will not be part of the Proposal evaluation. The purpose of the first demonstration is to assist the MBTA in determining whether and how, if necessary, to further refine the Technical Requirements, with a specific focus on accessibility requirements. Proposers may choose not to participate in this event, and the equipment shown at this event does not need to reflect the equipment proposed to be part of the Project. Any equipment demonstrated at this event must be in use in another transit setting.

If any Proposer elects not to conduct the initial demonstration, such Proposer shall inform the Point of Contact, via email, no later than the date of such Proposer's first Individual Meeting. At least 20 business days prior to the date on which each demonstration begins, Proposers intending to participate in the event shall inform the Point of Contact, via email, of the number of people attending the demonstration and of the point person responsible for coordinating the event on behalf of the Proposer.

The MBTA has secured space at the John B. Hynes Veterans Memorial Convention Center for the purpose of conducting the initial demonstration. Each Proposer will be provided with approximately 1,000 sf of dedicated space at the convention center that will not be accessible to other Proposers. Information concerning the convention center can be found at the following electronic link:

http://s3.amazonaws.com/signatureboston/documents/EventGuide_Hynes_V2.5.pdf

Upon designation in accordance with this Section 2.13, the point person responsible for coordinating the event on behalf of the Proposer will be directed to appropriate convention center representatives for detailed coordination. Each Proposer electing to participate in the initial demonstration event will be responsible for coordinating with such convention center representatives and purchasing any desired services not included in the MBTA's rental agreement, such as catering, extra power, labor to move equipment, etc. Each Proposer electing to participate in the event shall comply with all safety requirements established by the convention center and shall be solely responsible for all risk and liability associated with its participation in the event. Proposers participating in the event may be required to provide evidence of appropriate insurance to the convention center and enter into an appropriate indemnification agreement with the convention center and the MBTA.

The second demonstration is mandatory and will be part of the Technical Proposal evaluation. For the second demonstration, an MBTA field team will travel to Proposer's offices following the Technical Proposal Submittal Date, provided that such offices are located in the U.S. or

Canada. The MBTA field team will be comprised of members of the MBTA Project team, including members of the MBTA Consultant Support Team. The purpose of the second demonstration is to give Proposers the opportunity to demonstrate to the MBTA field team how the proposed Devices and key System Elements could comply with the Technical Requirements. The demonstration shall take place in a laboratory environment at Proposer's offices, and shall include a demonstration of at least one representative device for each proposed Device for a period of at least one full day. Such Devices shall demonstrate functionality that is operational in existing deployments, and the demonstration shall include an explanation of the functionality and a description of how such functionality will be tailored to or otherwise satisfy the Technical Requirements.

During the second demonstration, each Proposer is required to:

- (1) Make available devices similar to those being proposed for use, including one of each of the following:
 - FVMs (Full-Functionality, Limited-Functionality and any other Variants)
 - Gates (standard Gate and Accessible Gate)
 - Validators (Station Validator and Vehicle Validator)
 - Inspection Device
- (2) Demonstrate features and functions of each device, including:
 - Successful and unsuccessful interactions with devices;
 - Usability and accessibility considerations;
 - Impact resistance; and
 - The device functionality and user experience associated with a fare vending machine which does not provide change (if such cost-saving option is proposed)
- (3) Explain how the demonstrated devices will be tailored to meet the Technical Requirements.
- (4) Answer questions from MBTA field team about how the demonstrated devices will be tailored to meet the Technical Requirements.
- (5) Provide cash pool and payment cards for test transactions.
- (6) Provide each type of Credential required by the MBTA for test Taps:
 - Standard Fare Card
 - Temporary Fare Card (if proposed)
 - Mobile Fare Card
 - Contactless EMV Card
- (7) Simulate interactions with the devices, in both standard and non-standard ways.
- (8) Allow the MBTA field team to interact with the devices and test transactions.
- (9) Support test transactions (both with software and assistance from staff).
- (10) Demonstrate back office functionality, including fare calculation, flow of funds, maintenance and self-reporting.
- (11) Demonstrate website functionality through a live dynamic demonstration of a website developed for another client, shown on mobile, tablet and desktop devices.

In accordance with Section 5.7, Proposers will also be required to make an oral presentation to the Selection Committee during their interview concerning their proposed Devices, but will not be required to bring any such Devices to the interview.

By May 31, 2017, Proposers shall provide to the Point of Contact, via email, location information and a list of times and dates in August 2017 during which Proposers are available to conduct the demonstrations. Upon receipt of such information, the MBTA will provide the Proposers with the confirmed date, location and time of such demonstrations.

2.13.2 Reference Project Site Visits

An MBTA field team may also visit the site(s) of the reference projects that the Proposer describes in its Proposal. In the event the MBTA field team does conduct reference project site visits, such visits will occur during the same window of time as the second demonstration and will not require Proposer participation. The MBTA will not disclose to Proposers which sites, if any, the MBTA field team visits.

Proposers shall submit a completed Proposal Form 21 with their Technical Proposals. On Proposal Form 21, Proposers may nominate up to three of the reference projects listed in their Proposals for the MBTA reference project site visits. The MBTA reserves the right to visit any of the reference projects that the Proposers describe in their Proposals, including reference projects that are not listed on Proposal Form 21.

2.13.3 Findings and Observations

Following the demonstrations and reference project site visits, the MBTA field team will report their findings and observations on both the demonstrations and the Proposer reference project site visits to the Selection Committee, and the Selection Committee will consider such reported findings and observations during their evaluation of the Technical Proposals.

2.14 Governing Law

2.14.1 Applicable Law

The laws of the Commonwealth of Massachusetts will govern this RFP and the Project Agreement.

Proposers must comply with certifications and assurances set forth in Proposal Form 15, Proposal Form 16, Proposal Form 17 and Proposal Form 18, as required by the MBTA and Commonwealth of Massachusetts (collectively, the "**State Certifications and Assurances**").

Each Proposer is responsible for acknowledging and ensuring that it complies with the State Certifications and Assurances. Non-compliance with the State Certifications and Assurances may render a Proposer non-responsive and disqualify the Proposer from further consideration.

2.14.2 Compliance with Standards, Codes and Laws

The Systems Integrator will comply with the versions of the standards specified in the Technical Requirements and the Draft Project Agreement that are in effect at the time of the execution of the Project Agreement, as amended, modified, replaced or superseded during the Term of the Project Agreement.

2.14.3 Evidence of Corporate Registration

As described in Schedule A, Proposers are required to certify that they are listed under the Secretary of the Commonwealth's website (<https://www.sec.state.ma.us/cor/>) as licensed to do business in Massachusetts, as required by law. In the event the Proposer is a consortium, each member of the consortium is required to certify that they are listed under the Secretary of the Commonwealth's website as licensed to do business in Massachusetts. Proposers are not required to incorporate and register their proposed special purpose entities prior to award. Upon award, the Selected Proposer shall take all necessary steps to form and register prior to Commercial Close.

2.15 Diversity Requirements and Fair Employment

2.15.1 Diversity

It is the policy of the Commonwealth and the MBTA to ensure non-discrimination in the procurement of goods and services. It is the MBTA's intention to create a level playing field on which all contractors and subcontractors can compete fairly for contracts. The MBTA promotes equity of opportunity in contracting; and to that end, encourages full participation of veteran-owned, disability-owned, minority-owned, woman-owned and LGBT-owned business enterprises, as those terms are defined by the Commonwealth's Supplier Diversity Office.

2.15.2 Networking

During the RFP stage, the MBTA encourages and expects Proposers to pursue and encourage partnering opportunities with and for veteran-owned, disability-owned, minority-owned, woman-owned and LGBT-owned business enterprises. The MBTA intends to host a networking event to enable a large number of such business enterprises to meet with Proposers. The MBTA will notify Proposers and other interested parties of the scheduling and registration requirements associated with this event via Addendum.

2.15.3 Fair Employment Practices

The Project Agreement prohibits harassment, discrimination or retaliation against any employee or applicant for employment because of race, color, religion, creed, gender, national origin, age, disability, sexual orientation, genetic status, gender identity or veteran status. The Systems Integrator will be required to develop an EEO and Affirmative Action program to ensure that applicants employed are treated during employment without regard to their race, color,

religion, creed, gender, national origin, age, disability, sexual orientation, genetic status, gender identity, veteran status or other legally protected characteristic.

Proposers (and their subcontractors) that employ 50 or more persons, and will be entering into the Project Agreement or any contract thereunder in an amount of \$50,000 or more, shall submit an Affirmative Action/EEO Plan for the employment of minorities (as defined by applicable laws and regulations) and women as part of Volume 1 of their Proposals.

2.16 Background Documents

During the RFQ stage, the MBTA made available through the Business Center a set of Background Documents. During the RFP stage, the MBTA will make available through Firmex the RFQ Background Documents and additional Background Documents. A list of all Background Documents, including the additional Background Documents which will be made available via Firmex during the RFP stage, is provided in Schedule E. Any Background Documents listed in Schedule E but not yet available through Firmex will be made available via Firmex as they are finalized.

The Background Documents are provided for reference and background information only. The information contained in the Background Documents reflects information as of any date and time identified therein. Please note that for the following Background Documents listed in Schedule E, the MBTA has not determined whether such Background Documents are accurate, complete, pertinent, or of any other value to Proposers: Item 2.b – MBTA Maintenance Facility Analysis; Item 2.e – Ongoing MBTA Vehicle Programs Overview; Item 3.b – Egress Study; Item 3.e.iii – Commuter Rail Placement Study; Item 4.d – Gate Inspection Report; Item 4.e – Existing Gate Architecture; Item 4.l – Typical Panelboard Schedule; Item 4.m – Existing System Intellectual Property License Agreement; Item 6.e – Inspection Week Photos; and Item 6.f – MBTA Current Transaction Costs. The MBTA makes no representation as to the accuracy, completeness, or pertinence of such Background Documents. The MBTA shall not be responsible for any interpretations thereof or conclusions drawn therefrom. The Systems Integrator may be entitled to Supervening Event relief as and to the extent provided in the Project Agreement in the case of errors or omissions associated with other Background Documents listed in Schedule E.

Any statements made in Background Documents that are not purely historical are forward-looking statements, including the MBTA's expectations, intentions or strategies regarding the future. These statements are based on information currently available to the MBTA, and the MBTA assumes no obligation to update any such forward-looking statements.

Proposers must submit to the Point of Contact, via email, completed Proposal Forms 17 and 18 by January 20, 2017. Proposers shall submit a completed Proposal Form 18 signed by a representative of the Proposer on behalf of the Proposer Team and a completed Proposal Form 17 containing the signatures of each of the individuals reviewing or receiving security-sensitive information, as further described in Proposal Form 17. In the event that a Proposer wishes to share security-sensitive information with any individuals who have not signed Proposal Form

17, Proposers shall submit a completed Proposal Form 17 for any such individuals to the Point of Contact, via email, prior to granting such individuals access to any such information.

2.17 MBTA Consultant Support Team

The following entities have been retained to serve as the primary Consultant Support Team for the Project:

- Accelare, Inc. (PMO; support)
- Bay Computer Associates, Inc. (engineering)
- Central Transportation Planning Staff (CTPS) (technical support)
- CH2M Hill (engineering)
- Consult Hyperion; CHyp USA, Inc. (payments technology)
- Diane McDevitt Consulting, Inc. (payment processing consultant)
- FTG Technologies dba FTG Technology (communications networks engineering consulting)
- Future Technologies Group, LLC (communications networks engineering consulting)
- Ernst & Young Infrastructure Advisors LLC (financial advisors)
- Ernst & Young LLP (financial advisors)
- George Kocur (technical consultant)
- Hawkins Delafield & Wood LLP (legal advisors)
- Holland & Knight LLP (legal advisors)
- Intelligent Systems & Controls Contractors, Inc. dba FTG Security (communications networks engineering consulting)
- Jacobs Engineering Group (engineering)
- LTK Engineering Services (cost estimating)
- McInnis Consulting Services, Inc. (staffing)
- Nitsch Engineering (engineering)
- Prince Lobel Tye LLP (legal advisors)
- Verizon (mobile private network)

Except as provided in Section 1.4.6 of Appendix 2.5, members of the Consultant Support Team are not eligible to assist or participate as Proposer Team members with any Proposer without the express written consent of the MBTA in its discretion.

Additional members may be added to the Consultant Support Team for the Project. The MBTA may identify any new members in an Addendum if and when a member is added.

The Consultant Support Team has provided assistance to the MBTA in preparing the RFQ and RFP and in evaluating the SOQs. The Consultant Support Team will also provide assistance to the MBTA in evaluating the Proposals and negotiating the Project Agreement. Members of the Consultant Support Team may also provide Project oversight.

2.18 Closing Checklist

On or prior to November 1, 2017, the Selected Proposer shall submit to the MBTA Point of Contact, via email, a draft Financial Close checklist which:

- a) Provides a timeline for achieving Financial Close by the Financial Close Deadline; and
- b) Identifies all documents, submissions and other actions (including actions of the Selected Proposer and the MBTA, and any required action of a third party) then reasonably anticipated by the Selected Proposer to be necessary to achieve Financial Close by the Financial Close Deadline.

The MBTA and the Selected Proposer shall use all reasonable efforts to deliver, respond to and comment on the documents, including draft documents and the draft checklist, necessary to satisfy the Financial Close Conditions in conformity with the closing checklist and timeline.

3. RFP Procurement Process

3.1 Procurement Objectives

In addition to the Project goals identified in Section 2.3 of this RFP, the MBTA's objectives for this procurement are as follows:

- A) Identification of a Systems Integrator that will be a long-term partner for the MBTA and that will be committed to a joint goal of ensuring that the new Project Agreement underpins the MBTA's reputation as one of the leading public transportation authorities in the United States;
- B) Innovative delivery of the Project on an efficient and economic basis;
- C) Selection of a Systems Integrator able to demonstrate and ensure diversity, inclusion, creativity, accountability and transparency in its overall employment, contracting, subcontracting and purchasing practices over the life of the Project Agreement so that there is continuing compliance with all applicable laws and regulations; and

Massachusetts Bay Transportation Authority

- D) Procurement of a Project Agreement that will deliver immediate and identifiable improvements for the MBTA and its passengers and a program of sustainable and affordable enhancements to the passenger experience.

3.2 DB Entity Procurement

As described above in Section 2.6.2.4, the MBTA will separately procure and contract with the DB Entity for the performance of the DB Installation Work.

Proposers, and Proposer Team members, will not be eligible to respond to the request for qualifications for the DB Entity.

3.3 Procurement Schedule

3.3.1 Procurement Schedule for Systems Integrator

The following represents the current procurement schedule for the Systems Integrator. The schedule is subject to change at the discretion of the MBTA.

| Activity | Due Date |
|--|--------------------------|
| Issue Request for Proposals and Draft Project Agreement | November 15, 2016 |
| Proposer Inspection of Public Areas at MBTA Stations | November - December 2016 |
| Deadline for Submittal of Proposer Agenda, Comments to RFP and Questions for First Set of Individual Meetings | December 2, 2016 |
| First Set of Individual Meetings with Proposers | December 6-8, 2016 |
| Deadline for Proposers to Notify MBTA of Participation in Optional Proposer Demonstrations | December 16, 2016 |
| Issuance of Addenda Providing Documents Omitted From Initial Issuance and Addressing Certain Matters Relating to First Set of Individual Meetings | December 21, 2016 |
| Deadline for Proposers to Request Access to Non-Public Areas at MBTA Stations, and Provide List of Attendees | December 21, 2016 |
| Deadline for Submittal of Proposer Agenda, Comments to RFP and Questions for Second Set of Individual Meetings (Technical Focus) | January 10, 2017 |
| Issuance of Addenda Addressing Comments Received and Issues Discussed at First Set of Individual Meetings, including revised Draft Project Agreement | January 10, 2017 |
| Proposer Inspections of MBTA Vehicles and Non-Public Areas at MBTA Locations (orientation meeting to begin on the first morning)* | January 17-22, 2017 |

Massachusetts Bay Transportation Authority

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|--|---------------------|
| Optional Proposer Demonstrations in Boston* | January 17-26, 2017 |
| Second Set of Individual Meetings with Proposers (Technical Focus)* | January 23-24, 2017 |
| Webinar on Appendix 8 (Payment Mechanism) | February 2, 2017 |
| Deadline for Proposers to Submit Any Questions or Comments for Inclusion in Addendum #8 | February 8, 2017 |
| Issue Revised Draft Project Agreement and RFP (Addendum #8) | February 28, 2017 |
| Submittal of Proposer Agenda, Comments to RFP and Questions for Third Set (Non-Technical Focus) of Individual Meetings and Information relating to Date, Time and Location of Second Set of Proposer Demonstrations | March 14, 2017 |
| Third Set of Individual Meetings with Proposers (Non-Technical Focus)* | March 20-23, 2017 |
| Deadline for Proposers to Submit Any Questions, Comments to the RFP and Draft Project Agreement, and Requests for Clarification for Inclusion in Addendum #11 | April 3, 2017 |
| Issue Revised Draft Project Agreement and RFP (Addendum #11) | May 17, 2017 |
| Fourth Set of Individual Meetings with Proposers (via videoconference) | May 24, 2017 |
| Deadline for Proposers to Submit Any Final Questions, Comments and Requests for Clarification on the Procurement Schedule | May 31, 2017 |
| Deadline for Proposers to Submit Any Final Questions, Comments to the RFP and Draft Project Agreement, and Requests for Clarification on the RFP, Technical Requirements and Project Agreement (Excluding Comments, Requests for Clarification or Questions on Topics Discussed During the Fifth Set of Individual Meetings) | June 6, 2017 |
| Fifth Set of Individual Meetings with Proposers | June 14-15, 2017 |
| Deadline for Proposers to Submit Any Final Questions, Comments and Requests for Clarification on Topics Discussed During the Fifth Set of Individual Meetings | June 23, 2017 |
| Deadline for MBTA to Respond to Questions and Requests for Clarification, Issue Addenda and Issue final Draft Project Agreement | June 28, 2017 |

Massachusetts Bay Transportation Authority

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|---|------------------------|
| Technical Proposal Submittal Date | August 16, 2017 |
| Benchmark Interest Rates provided by MBTA for use in Financial Proposals (“Interest Rate Addendum”) | October 6, 2017 |
| Proposer Presentations and Interviews (Technical Only)* | September 2017 |
| Proposer Demonstrations | August 2017 |
| MBTA Visits to Proposer Reference Project Sites | September 2017 |
| Amended PSRs contemplated by Addendum #16 Due Date | September 22, 2017 |
| Financial Proposal Due Date | October 20, 2017 |
| Execution of Early Works Agreement | November/December 2017 |
| System Demonstration and DB Scope Presentation by Selected Proposer to DB Entities* | November/December 2017 |
| Estimated Commercial Close Date | December 2017 |
| Estimated Financial Close Date | February 1, 2018 |
| Financial Close Deadline | March 21, 2018 |

* More details on logistics and schedule are provided in the RFP or will be provided via Addendum and direct communication with Proposer point of contact.

3.3.2 Procurement Schedule for DB Entity

The procurement schedule for the DB Entity, the development of the DB Plans and Specifications and DB Plans and Specifications, the completion of each Defined Phase, the achievement of the Key Milestones and compliance with the Project Schedule shall be governed by the requirements in the Draft Project Agreement.

3.4 Communications

3.4.1 Point of Contact

Proposers are prohibited from contact related to this procurement with any MBTA employee other than designated personnel from the date this RFP is issued until the Project Agreement has been approved. Violation of this provision may be grounds for immediate disqualification. All inquiries concerning this procurement must be addressed to the following designated contact for this procurement:

Susan D. Cobb, Deputy General Counsel, Contracts and Procurement
E-mail: AFC2responses@mbta.com

Only written requests to the above addressee will be considered. No requests for additional information or clarification to any other MBTA office, consultant, or employee will be considered. If the MBTA determines that a change or clarification to the RFP is needed, all

responses will be in writing and shall be made available as an Addendum, without attribution, to all Proposers.

3.4.2 Rules of Contact

The following rules of contact shall apply during this procurement process. Contact includes mail, face-to-face, telephone, facsimile, electronic-mail (E-mail), Q&A web portal or formal written communications. The MBTA's Point of Contact for this RFP is identified in Section 3.4.1 of this RFP.

The rules of contact are designed to promote a fair, unbiased, legally defensible procurement process. The MBTA is the single source of information regarding the Project procurement.

The procurement process began with the advertisement of the public notice, and is completed with the award of the Project Agreement. These rules of contact are now in effect. The specific rules are as follows:

- a) No Proposer or any of its members may communicate with another Proposer or members of another Proposer Team with regard to this procurement or the Project, except that a Proposer may communicate with a subcontractor that is on both its team and another Proposer Team provided that such subcontractor is not an Equity Member or Major Non-Equity Member, so long as those Proposers establish a protocol to ensure that the subcontractor will not act as a conduit of information between the Proposers (communication among Proposers and their members is allowed during MBTA sponsored site visits and meetings);
- b) Proposers shall not contact any firm actively competing to serve as the DB Entity on any matter relating to this Project. Once the shortlisted DB firms are announced under the DB Entity RFQ, Proposers shall not contact any of the DB firms shortlisted under the DB Entity RFQ, but may not be restricted from contacting any of the DB firms which were not shortlisted;
- c) Contact between the Proposers and the MBTA (questions and responses to questions) will only be through the Point of Contact or Q&A web portal and the Proposer's designated representatives;
- d) Proposers shall not contact MBTA or Commonwealth employees, including department heads and any official, regarding the procurement except through the process identified above;
- e) Any contact determined to be improper, at the sole discretion of the MBTA, may result in disqualification;
- f) Any official contact regarding the procurement will be either in writing, disseminated from the MBTA on MBTA letterhead and signed by the Point of Contact, or via the Q&A web portal and emails generated from the Q&A web portal system; and

- g) The MBTA will not be responsible for any oral communication or any other information or contact that occurs outside the official communication process specified herein. Information offered outside of the official communication process specified herein is not official, may be inaccurate and should not be relied on in any way, by any person for any purpose.

3.4.3 Proposer Questions and Answers

3.4.3.1 Generally

Proposers may submit written questions, comments or requests for clarifications relating to this RFP. Notwithstanding any deadline set forth in the Procurement Schedule, Proposers are encouraged to submit their questions as and when they are ready for submission. The MBTA will not respond to any oral inquiries or requests regarding this RFP. No oral information provided by MBTA staff or members of the Consultant Support Team will be binding on the MBTA or members of the Consultant Support Team, nor will it change, modify, amend or waive the requirements of this RFP in any way. While the MBTA encourages Proposers to submit any requests for clarification or questions via Firmex, the MBTA prefers that Proposers submit any comments requesting a change in the terms of the Draft Project Agreement or the Technical Requirements on Proposal Form 12 in the manner described in Section 3.11. In the event Proposers submit any comments or questions on Proposal Form 12, the MBTA requests that Proposers provide such Proposal Form 12 as both a PDF and a Microsoft Word document.

To obtain logon details for the Q&A web portal, Proposers must submit a list of designated representatives' names and email addresses to the Point of Contact. If the Proposer would like an individual on its Proposer Team to review all Proposer questions before the questions are submitted for the MBTA's viewing in the Q&A web portal, Proposers shall identify one designated representative as the "Question Coordinator." The Question Coordinator will be granted the authority to review all questions from the Proposer Team before they are submitted. If no Question Coordinator is identified, all designated representatives of the Proposer Team will be able to submit questions in the Q&A web portal.

In the event Proposers wish to submit questions through Firmex which contain proprietary or confidential information, Proposers can do so by submitting questions marked "confidential" through Firmex's message center. When submitting such questions, Proposers shall direct the questions to the Point of Contact. To ensure that the questions are securely archived, Proposers should not select the "email" option. Although questions which are submitted via Firmex and marked "confidential" or which are submitted on Proposal Form 12 will not be shared with Proposers during the RFP stage, any response that changes the terms and conditions of the RFP or Draft Project Agreement will be issued via Addendum to all Proposers. Responses to questions which are submitted via Firmex may also be shared with all Proposers directly through Firmex. In the event the MBTA determines that a question marked "confidential" does not contain confidential or proprietary information, the MBTA will notify the Proposer and provide the Proposer with an opportunity to withdraw the question (the response to which may still be shared with Proposers via Addendum if it changes the terms and conditions of the RFP or Draft Project Agreement); submit a revised question which does not

contain confidential or proprietary information; or agree with the MBTA's determination, in which case the question will be treated as a non-confidential question. The questions marked "confidential" are subject to release after Project Agreement award in accordance with Section 3.22 of this RFP.

In addition to the rules of contact set forth in Section 3.4.2 of this RFP, the following will apply to any inquiry or request received pursuant to this Section:

- a) The Point of Contact, or another authorized representative of the MBTA, will respond in writing or via Firmex;
- b) Responses will be sent via email or Firmex to the designated representatives;
- c) An inquiry and response may, in the MBTA's discretion, be distributed to all Proposers;
- d) An inquiry and response may be distributed only to the Proposer who submitted the question if, in the judgment of the MBTA, it is fair or appropriate to do so;
- e) The MBTA has the right not to respond to any inquiry or request; and
- f) The MBTA reserves the right to consider and respond to any reasonable logistical or administrative questions submitted after the final comment and question deadline set forth in Section 3.3.1 of this RFP to the extent necessary to facilitate timely and compliant delivery of Proposals.

3.4.3.2 Individual Meeting Materials

Pursuant to Section 3.10 of this RFP, each Proposer shall provide the Point of Contact, via email, with a proposed meeting agenda, a list of attendees, a list of prioritized issues it would like to discuss during the Individual Meeting and any materials relevant to such issues. To the extent that such list of prioritized issues involves comments to the Draft Project Agreement, Proposers shall submit such comments using Proposal Form 12 in accordance with Section 3.11. Notwithstanding the foregoing or anything to the contrary set forth in this RFP, the MBTA intends to prepare and provide each Proposer with an agenda for the fifth Individual Meeting based on final comments and questions received from such Proposer by the deadline set forth in Section 3.3.1 of this RFP.

3.5 Existing Conditions

The Background Documents include information relating to asbestos in MBTA vehicles. In accordance with the terms of the Draft Project Agreement, the Systems Integrator shall leave the asbestos undisturbed and shall not remediate or remove the asbestos. However, in the event that the Systems Integrator disturbs the asbestos disclosed in the Background Documents, the Systems Integrator will bear full and exclusive responsibility for any consequences arising from such disturbance, as further described in Article 6 of the Draft Project Agreement.

The MBTA will not be responsible for modifying any MBTA vehicle for purposes of System installation.

3.6 Inspection of MBTA Vehicles

The MBTA will provide Proposers with the opportunity to inspect MBTA vehicles as indicated in the Procurement Schedule set forth in Section 3.3.1 of this RFP. The MBTA has provided a Draft Vehicle Inspections Plan through Firmex for Proposer review and comment. Further information relating to the inspections may be provided via Addendum. Procedures governing the inspections will be made available via Firmex concurrently with the publishing of Addendum #4 on January 10, 2017. Proposers should note that attendance will be limited to a maximum of 10 representatives from each Proposer Team. During the inspection, Proposers will be accompanied at all times by an authorized representative of the MBTA. While Proposers may ask questions related to the MBTA vehicles, the MBTA will not answer questions related to the RFP requirements.

3.7 Station and Facility Visits

The MBTA will not facilitate a tour of the public areas of MBTA stations. During the RFP stage, the MBTA encourages Proposers to visit the public areas of MBTA stations to inform their Proposals. Proposers visiting such locations must comply with applicable law. Proposers must, however, give notice to the MBTA at least one Business Day prior to the date on which the Proposer intends to visit any public areas of any MBTA stations for longer than the amount of time a customer would normally spend in the station (5-15 minutes), or if the Proposer intends to take photographs, so that MBTA can notify personnel and avoid any misunderstanding as to the Proposer's presence. Such notice must identify each station which the Proposer intends to visit for more than 5-15 minutes or photograph, as well as the approximate time of day at which the Proposer intends to visit each station.

The MBTA will facilitate a tour of certain non-public areas of MBTA property, as indicated in the Procurement Schedule set forth in Section 3.3.1 of this RFP. Information relating to the time and location of the tour will be provided via Addendum. By the deadline set forth in Section 3.3.1 of this RFP, Proposers shall provide the Point of Contact, via email, with a list of the non-public location(s) that the Proposer wishes to view during the tour (including identifying areas and rooms within each location) and any measures they plan to take during the visit beyond basic visual observations and taking of measurements and photographs. The MBTA reserves the right to reject or otherwise limit any of the measures proposed by the Proposers. Proposers shall also inform the MBTA of the number of people attending the tour. Proposers should note that attendance will be limited to a maximum of 10 representatives from each Proposer Team. During the tour, Proposers will be accompanied at all times by authorized representative(s) of the MBTA. While Proposers may ask questions related to the MBTA property, the MBTA will not answer questions related to the RFP requirements and Proposers shall not rely upon anything said or indicated during the tour related to the RFP requirements except as set forth in an Addendum to the RFP.

3.8 Proposer Due Diligence and Investigation

Proposers must satisfy themselves, by personal investigation and any other lawful means they deem necessary, as to the conditions affecting the Contract Services and the cost thereof. Proposers are solely responsible for conducting their own independent research and due diligence for the preparation of Proposals. In order to provide Proposers with sufficient opportunities to conduct due diligence for the Project and prepare their Proposals, the MBTA also invites Proposers to review the Background Documents that the MBTA provides and to attend Individual Meetings.

The Selected Proposer is solely responsible for conducting its own independent research and due diligence for negotiation of the Project Agreement and subsequent delivery of the Contract Services. Information derived from any part of this RFP, or from the MBTA or its advisors, does not relieve the Systems Integrator from any risk associated with providing the Contract Services and meeting the requirements of this RFP. The MBTA and its advisors are not responsible for the completeness or accuracy of any information presented in this RFP or otherwise distributed or made available during the procurement process.

3.9 Professional Advice

Proposers are responsible for obtaining professional advice from their own advisors and experts. This includes legal advice together with any other professional advice a Proposer determines to be appropriate or necessary.

3.10 Individual Meetings

The MBTA will invite each Proposer to participate in periodic meetings with the MBTA and members of its Consultant Support Team (“Individual Meetings”), with the anticipated dates for such meetings set forth in Section 3.3.1 of this RFP. Each meeting will be proprietary, in that only one Proposer will meet with the MBTA at a time. The purposes of the Individual Meetings include (i) providing the MBTA with information regarding the Proposers’ design and design concepts, (ii) enabling discussion concerning particular solutions Proposers may be considering, (iii) providing an opportunity for the Proposers and the MBTA to discuss issues such as innovation in the Project, and future use and development of the Project, (iv) providing Proposers with the opportunity to discuss the Draft Project Agreement with the MBTA, and (v) other purposes established by the MBTA.

In accordance with the Procurement Schedule set forth in Section 3.3.1 of this RFP, each Proposer should provide the MBTA in advance of each Individual Meeting a proposed meeting agenda, a list of attendees, a list of prioritized issues it would like to discuss, and any materials relevant to such issues, as further described in Section 3.10 of this RFP, and submitted in accordance with the procedures set forth therein.

At each Individual Meeting, a Proposer is expected to bring such Key Personnel as the Proposer considers reasonably necessary for effective communication with the MBTA and to fulfill the objectives of the Individual Meeting, including the appropriate Key Personnel. The MBTA may, in its discretion, limit the number of participants at any one meeting. Participation

in Individual Meetings is in person only. At the beginning of each meeting, a representative of the MBTA will read guidelines which will govern the meeting. Each member of the Proposer Team attending the meeting will be required to confirm their agreement to such guidelines by signing an attendance sheet. Because of the proprietary nature of these meetings, the agenda, minutes and any follow-up discussions or communications will not be subject to disclosure.

To facilitate free and open discussion at the Individual Meetings, Proposers should note that any comments provided by or on behalf of the MBTA during any Individual Meeting, including in respect of any particular matter raised by a Proposer or which is included in any documents or information provided by a Proposer prior to or during the Individual Meeting, and any positive or negative views, encouragement or endorsements expressed by or on behalf of the MBTA during the Individual Meetings to anything said or provided by Proposers, will not in any way bind the MBTA and will not be deemed or considered to be an indication of a preference by the MBTA even if adopted by the Proposer. Proposers shall not rely upon anything said or indicated at an Individual Meeting except as set forth in an Addendum to the RFP, and the MBTA will not discuss any Proposals with a Proposer other than the Proposer's own.

The MBTA anticipates holding two or more Individual Meetings with each Proposer prior to the Proposal Submittal Date. If the MBTA considers it desirable or necessary to schedule additional or fewer Individual Meetings, the MBTA may, in its discretion, amend the anticipated schedule.

3.11 Comments to the RFP or Draft Project Agreement

Each Proposer must identify issues or specific provisions of the RFP, the Draft Project Agreement or Technical Requirements, including all Transaction Forms and Appendices, that the Proposer requests to have clarified or amended. The MBTA invites Proposers to discuss possible clarifications or amendments to the RFP, the Draft Project Agreement or the Technical Requirements during the Individual Meetings, as follows:

- a) Proposers may raise for discussion aspects of the RFP, the Draft Project Agreement or the Technical Requirements regarding commercial, legal matters, design, implementation, and operations and maintenance matters.
- b) Proposers must provide the MBTA with requested changes to the RFP or Draft Project Agreement in the form provided in Proposal Form 12 in advance of the Proposer's Individual Meeting, and indicate which requested changes or comments to the RFP, the Draft Project Agreement or the Technical Requirements that the Proposer would like to prioritize during discussion at the Individual Meeting.

The MBTA also reserves the right to require a Proposer, subject to prior written notice, to be prepared to discuss any issue at an Individual Meeting, which issue the Proposer has not previously requested be the subject of such a discussion.

3.12 Proposed Changes to the Terms of the RFP or Draft Project Agreement

If any of the Proposer's comments to the RFP or Draft Project Agreement submitted in accordance with Section 3.11 of this RFP would result in a material change in the financial or commercial terms of the RFP, Draft Project Agreement or the Technical Requirements, the Proposer shall include in the completed Proposal Form 12 a description of any net cost savings that would accrue to the MBTA should the proposed change be approved and implemented. If any of the Proposer's requests for clarification, comments or questions submitted in accordance with Section 3.4.3 of this RFP would result in a material change in the financial or commercial terms of the RFP, Draft Project Agreement or the Technical Requirements, the Proposer shall submit with such comment, via the Q&A web portal, a description of any net cost savings that would accrue to the MBTA should the proposed change be approved and implemented.

3.13 Changes to the RFP or Draft Project Agreement

The MBTA will consider Proposers' comments and requested clarifications or amendments, and may in its discretion amend the RFP or Draft Project Agreement. Pursuant to Section 3.14 of this RFP, the MBTA will issue Addenda to this RFP if it amends the RFP or Draft Project Agreement, together with all appropriate revisions or clarifications.

After consideration of any Proposer comments and as the Draft Project Agreement may have been amended pursuant to this section, the MBTA will issue the final form of the Draft Project Agreement to all Proposers. The final form, as issued by the MBTA, will be the common basis for all Proposals.

If the MBTA determines, based on comments to the RFP or Draft Project Agreement or otherwise, that the RFP contains an error, ambiguity or mistake, the MBTA reserves the right to modify the RFP to correct the error, ambiguity or mistake.

3.14 Request for Proposals Addenda

This RFP is subject to revision after the date of advertisement via written Addenda. Any such Addenda will be made available through Firmex. Any Addenda to this RFP will be numbered consecutively and will be posted through Firmex. These Addenda will be issued by, or on behalf of, the MBTA and will constitute a part of this RFP. It is the Proposer's responsibility to check Firmex frequently and access such Addenda from Firmex. Each Proposer is solely responsible for obtaining all Addenda prior to submitting its Proposal. The MBTA assumes no responsibility or liability whatsoever for the distribution of Addenda to Proposers.

Each Proposer is required to acknowledge in its Technical Proposal Transmittal Letter the receipt of all Addenda at the time of the Technical Proposal Submittal Date and in its Financial Proposal Transmittal Letter the receipt of all Addenda at the time of the Financial Proposal Submittal Date, and, if required, revised Proposal submittals. All responses to this RFP shall be prepared with full consideration of the Addenda issued prior to such response.

3.15 Selection Committee

The Selection Committee will be responsible for evaluating the Proposals and making a recommendation as to the Selected Proposer. Proposals may be reviewed by the MBTA, other Commonwealth Agencies and members of the MBTA's Consultant Support Team.

3.16 Proposal Submittal, Evaluation and Award

Proposals shall submit Proposals in accordance with the requirements detailed in Schedule A by the deadlines set forth in Section 3.3.1 of this RFP.

Each Proposer shall base their Proposal on the RFP, as revised by Addenda, and on the final Draft Project Agreement. Proposers shall not include any proposed changes to the final Draft Project Agreement in their Proposals, and shall submit any proposed changes to or comments on the final Draft Project Agreement by the deadline set forth in Section 3.3.1 of this RFP.

As further described in Article 5 of this RFP, the MBTA will conduct a preliminary responsiveness review of Technical Proposals to assess responsiveness and to identify any aspect of the Technical Proposal that requires Clarification. After completion of the Technical Proposal responsiveness review and Clarification process, Technical Proposals will be evaluated using the Technical Proposal evaluation process and the evaluation criteria set forth in Article 5 of this RFP. Once Financial Proposals have been submitted, the MBTA will then conduct a preliminary responsiveness review of the Financial Proposals. Following the responsiveness review of the Financial Proposals, responsive Financial Proposals will be evaluated on the basis of price in accordance with Section 5.4 of this RFP.

The MBTA may, in its sole discretion, perform other due diligence investigations with respect to any information submitted in a Proposal.

3.17 Best Value Determination

The MBTA has concluded that selection of the most advantageous Proposer will be based on a best value determination that provides the best opportunity to obtain the right Systems Integrator to assure successful delivery of the Project.

In determining the best value, the MBTA will determine whether the Proposals are responsive based on an evaluation of the threshold evaluation factors described in Section 5.1 and Section 5.3 of this RFP. Following the responsiveness review, all responsive Technical Proposals will be evaluated in the manner described in Section 5.2 of this RFP and the MBTA will assign an overall rating for the Technical Proposals. Then, after evaluating the Financial Proposal and assigning a score to the Price Proposals, the MBTA will determine the best value.

The MBTA will not select any Proposal that receives a zero for any of the technical evaluation topics or a score of one for more than four of the technical evaluation topics. The MBTA will not select any Proposer that the MBTA determines has submitted a non-responsive Proposal or to have submitted any pricing information that is not reasonable, responsible or balanced.

3.18 Negotiation of the Project Agreement with the Selected Proposer

In both the Technical Proposal Transmittal Letter and the Financial Proposal Transmittal Letter (Proposal Form 1A and Proposal Form 1B), Proposers are required to agree to negotiate in good faith to enter into a Project Agreement that reflects the substantive terms and conditions of this RFP and the Proposal. The MBTA expects that the Draft Project Agreement review and comment process completed prior to the submittal of Proposals will result in a substantially agreed upon form of the final Draft Project Agreement. Unless there is a change in law or other Supervening Event occurring between the Technical Proposal Submittal Date and the Effective Date, the MBTA does not intend to discuss or negotiate any issue, term or condition of the final Draft Project Agreement. In the event that a Selected Proposer raises any issue, term or condition which does not relate to a change in law or other Supervening Event, the MBTA reserves the right to suspend or terminate negotiations with such Proposer and proceed in any manner that the MBTA may decide is in its best interests, including terminating the procurement process entirely and proceeding with some or all of the Project in some other manner or inviting one of the other Proposers to enter into negotiations with the MBTA.

3.19 Early Works Agreement

The MBTA intends to enter into an Early Works Agreement with the Selected Proposer within 10 Business Days following the Date of Award. In the event that the MBTA does not sign the Early Works Agreement within 10 Business Days following the Date of Award, any dates relating to deliverables under the Early Works Agreement shall be adjusted on a day-per-day basis. In order to facilitate the execution of the Early Works Agreement within such timeframe, the MBTA requests that any Proposers who intend to enter into such Early Works Agreement provide, through their completion of Proposal Form 20A, a commitment to enter into the Early Works Agreement. Any Proposers intending to enter into the Early Works Agreement shall also provide a proposed scope of work to be performed under the Early Works Agreement, which must include the work identified on Proposal Form 20A, and hours of labor and quantities of materials, goods and equipment for such proposed scope of work.

Regardless of whether the Selected Proposer enters into the Early Works Agreement, the Selected Proposer will be required to complete the Cost-Certain Specifications as a condition precedent to Financial Close.

A draft of the Early Works Agreement is provided as Proposal Form 20. Proposers are invited to provide comments on the form of Early Works Agreement on or prior to the final Proposer comment deadline set forth in Section 3.3.1 of this RFP.

3.20 Forfeiture of Proposal Letter(s) of Credit

In the event the MBTA elects to commence negotiations with the Selected Proposer, such Proposer will be deemed to have failed to engage in good faith negotiations with the MBTA and shall forfeit its Proposal Letter(s) of Credit if the following circumstances occur: (a) Proposer fails to attend and actively participate in reasonably scheduled negotiation meetings with the MBTA, (b) Proposer insists upon terms or conditions for any document to be negotiated or provided by the Systems Integrator in a manner inconsistent with the

requirements of this RFP, or (c) Proposer otherwise violates any material term and condition of the RFP.

3.21 Stipend for Unsuccessful Proposers

For those Proposers that submit a responsive Technical Proposal in the judgment of the MBTA and are not awarded the Project Agreement, the MBTA shall offer a stipend of \$500,000 (“Stipend”) subject to receipt of Proposal Form 19 and subject to and pursuant to the terms and conditions of an agreement in the form attached as Proposal Form 19.

If a Proposer wishes to be eligible to receive a Stipend, it shall execute and deliver to the MBTA one originally executed copy of the Stipend Agreement no later than the Technical Proposal Submittal Date. After the required approvals have been obtained, the MBTA will return to the Proposer a copy of the fully executed original. Payment of the Stipend will be made by wire transfer as specified in the Stipend Agreement, subject to the terms and conditions set forth therein. If a Proposer accepts and the MBTA pays the Stipend, the MBTA will be entitled to use (or permit the use of), at the MBTA’s risk, any work product contained in the Proposal, including the techniques, methods, processes, concepts and information contained in the Proposal, for all purposes associated with the continued development, implementation, operation or expansion of the Project.

Each Proposer shall bear the cost of preparing the Proposal and any costs incurred at any time before or during the Proposal process, including costs incurred for any interviews and demonstrations, except as may be offset by any amounts paid in accordance with this Section.

3.22 Confidentiality

All Proposals received in response to this RFP shall become the property of the MBTA and may not be returned. Until after termination of the selection process or completion of negotiations on, and Selection Committee recommendation to the MBTA’s Board of Directors concerning award of, the Project Agreement, only the name of each Short-Listed Respondent will be available to the public. However, the Selection Committee may incorporate key parts of the Proposals (e.g. Financial Proposal) into their report to the MBTA’s Board of Directors. The MBTA will seek to hold all Proposals in confidence, to the extent consistent with Applicable Law. Proposers are advised that all materials received by the MBTA which fall within the definition of a “public record” pursuant to M.G.L. c. 4, §7, c1.26 will be disclosed by the MBTA upon request after Project Agreement award.

Information relating to the Proposer’s financial and other capacities to perform under the Project Agreement may be subject to audit and must be submitted by the Proposer in a format clearly marked “confidential,” and the information contained therein will be treated as confidential.

Further, if a Proposer submits information in its Technical Proposal or Financial Proposal that it wishes to protect from disclosure, the Proposer must do the following:

Massachusetts Bay Transportation Authority

- A) Clearly mark all proprietary or trade secret information as such in its Technical Proposal or Financial Proposal at the time each such Proposal is submitted and include a cover sheet stating “DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY OR TRADE SECRET INFORMATION” and identifying each section and page which has been so marked;
- B) Include a statement with its Technical or Financial Proposal justifying the Proposer’s determination that certain records are proprietary or trade secret information for each record so defined;
- C) Submit with the Financial Proposal one electronic copy, on a flash drive or CD, of the full Proposal (including the Technical Proposal and the Financial Proposal) that has all the proprietary or trade secret information deleted from the Proposal and label such copy of the Proposal “Public Copy”; and
- D) Defend any action seeking release of the records it believes to be proprietary or trade secret information and indemnify, defend, and hold harmless the MBTA and its agents and employees from any judgments awarded against the MBTA and its agents and employees in favor of the party requesting the records, including any and all costs connected with that defense. This indemnification survives the MBTA’s cancellation or termination of this procurement or award and subsequent execution of a Project Agreement. In submitting a Proposal, the Proposer agrees that this indemnification survives as long as the confidential business information is in possession of the MBTA.

The MBTA shall not under any circumstance be responsible for securing a protective order or other relief enjoining the release of information marked proprietary or trade secret information in any Proposal, nor shall the MBTA be in any way financially responsible for any costs associated with securing any such order or for any loss associated with the release of information marked proprietary or trade secret information or otherwise.

Proposers shall not submit an electronic copy of the Proposal Public Copy with their Technical Proposals.

3.23 Debriefings

All Proposers submitting Proposals will be notified in writing of the results of the evaluation process. Proposers not selected for award may request a debriefing. Debriefings shall be provided at the earliest feasible time after execution of the Project Agreement. The debriefing shall be conducted by a procurement official familiar with the rationale for the selection decision and award of the Project Agreement.

Debriefings shall:

- a) Be limited to discussion of the unsuccessful Proposer’s Proposal and may not include specific discussion of a competing Proposal;

- b) Be factual and consistent with the evaluation of the unsuccessful Proposer's Proposal; and
- c) Provide information on areas in which the unsuccessful Proposer's Technical Proposal had weaknesses or deficiencies.

Debriefing may not include discussion or dissemination of the thoughts, notes or rankings of individual members of the Selection Committee, but may include a summary of the rationale for the selection decision and the award of the Project Agreement.

3.24 Ownership of Proposal Materials

All materials submitted in response to any part of this RFP shall become the sole property of the MBTA, without payment or liability for payment, except as may be provided in the Stipend Agreement. Notwithstanding anything to the contrary, no documents shall be returned to Proposers.

3.25 Proposer Teams

3.25.1 Proposer Team Members

Proposers are required to include in Volume 1 of their Technical Proposals a completed Proposal Form 2 identifying the team member(s) who will be performing the roles/services identified in Section 1-2 of Schedule A. For any team members and key personnel which were not identified in the Proposer's SOQ, the Proposer shall also include in Volume 1 of its Technical Proposal completed Proposal Forms 3 and 4.

3.25.2 Relationship Disclosure and Review Process

Proposers are responsible for disclosing all potential organizational conflicts of interest in their Proposals. A potential organizational conflict of interest may occur in any of the following instances:

- A) Where a Proposer is unable, or potentially unable, to provide impartial and objective assistance or advice to the MBTA due to other activities, relationships, contracts or circumstances;
- B) Where a Proposer has an unfair competitive advantage through obtaining access to non-public information during the performance of an earlier contract; or
- C) Where, during the conduct of an earlier procurement, a Proposer has established the ground rules for a future procurement by developing specifications, evaluation factors or similar documents.

The Proposer is required to provide information concerning potential organizational conflicts of interest in its Proposal. Proposers must submit with their Proposals a complete Relationship Disclosure Form in the form provided as Proposal Form 5, for all Proposer Team members and other individuals specified by the MBTA from time to time. In addition to submitting a

completed Proposal Form 5, Proposers, including all constituent entities, must promptly disclose to the Point of Contact any conflict of interest, potential or reasonably perceived conflict of interest, and existing business relationships they may have with the MBTA or members of the Consultant Support Team. If there is a conflict, whether current, potential or perceived, the Proposer must describe how it intends to avoid the conflict or potential conflict.

The MBTA will analyze any potential organizational conflicts of interest in order to avoid, neutralize or mitigate potential conflicts before Contract award. If a potential or real organizational conflict of interest is determined to exist that cannot be neutralized or mitigated, the firm or firms subject to the potential or real organizational conflict of interest will be ineligible to propose. Any determinations rendered by the MBTA regarding organizational conflicts of interest will be final. In addition, any firm that is rendered ineligible through any state or federal action is rendered ineligible to participate with any Proposer/Proposal (or foreign equivalent thereof).

Key personnel of members of the Consultant Support Team and other personnel of firms that may be contracted or retained by the MBTA to work on the Project will also be ineligible (regardless of their employment status on the Effective Date).

The MBTA reserves the right to disqualify any Proposer, or individual Proposer Team member, or to reject the Proposal of any Proposer that, in the MBTA's opinion, has a conflict of interest, whether such conflict exists now, is likely to arise in the future, or may reasonably be perceived to exist.

3.25.3 Changes to Proposer Teams

The MBTA requires that the Proposer's organization, including key personnel (as identified in the SOQ), remain intact for the duration of the procurement process and for a reasonable time after execution. A Proposer may propose substitutions for participants after the SOQ submittal. If for any reason a Proposer wishes or is required to add, remove, or otherwise change a member of its Proposer Team, there is a material change in ownership or control of a member of the Proposer Team, or there is a change to the legal relationship among any or all of the Proposer and its Proposer Team members, Proposer shall submit a written application to the MBTA no later than 30 days prior to the Technical Proposal Submittal Date. The MBTA may refuse or may grant permission for such an addition, removal or change, considering the objective of achieving a competitive procurement process that is not unfair to other Proposers. Without limiting the MBTA's discretion, the MBTA may refuse to permit an addition, removal or change to the membership of the Proposer Team if:

1. the new Proposer Team would in the MBTA's judgment result in a weaker Proposer Team than the Proposer's original constitution; or
2. the evaluation of the new Proposer Team, using the evaluation criteria described in the RFQ, would rank them lower than a respondent under the RFQ that was not included as one of the Short-Listed Respondents.

The MBTA may, in its sole discretion, permit any additions, removals or changes to the membership of the Proposer Team, including changes as may be requested arising from changes in ownership or control of a Proposer or a Proposer Team member, or changes to the legal relationship between the Proposer and another Proposer Team member such as the creation of a new joint venture or other legal entity in place of a Proposer Team member.

The MBTA reserves the right to require replacement of a member of the proposed Proposer Team in the course of its review. Without limiting the foregoing, the MBTA has the right to disqualify any Proposer or to reject the Proposal of any Proposer if the MBTA determines that inclusion of a member of the Proposer's team, or the addition, deletion or change of a member of the Proposer's team, creates a material possibility of reputational or legal risk in making the award.

The MBTA's rights set forth in this Section will apply from the date of issuance of this RFP until the Effective Date.

4. Proposal Requirements

4.1 Overview of Proposal Submittal Requirements

Proposers shall submit a Proposal in accordance with the instructions provided in this article of the RFP. All Proposals shall be complete, with all requested information, data and attachments. To facilitate review of Proposals, Proposers are urged to be thorough but brief and, where possible, use tables and diagrams as opposed to text. Any text discussions should include references to the design drawings, diagrams and Proposal Forms.

Proposers are advised that, as part of the negotiations of the Project Agreement, portions of the Selected Proposer's Proposal will be included or integrated into the Draft Project Agreement. The MBTA reserves the right to include (or exclude) in the Project Agreement any information submitted in the Proposal.

Failure of the Proposer to provide all requested information in the requested format may result in a determination by the MBTA, in its sole discretion, that the Proposal is non-responsive to the requirements of the RFP.

4.2 Proposal Deadline and Packaging of Proposals

4.2.1 Date, Time and Location of Receipt

Proposals shall be submitted on or before 2:00 PM EST on the dates referenced in Section 3.3.1 of this RFP. The submittals will not be considered complete until all hard copies and the electronic submittals are received. Proposals received after this deadline will not be considered and may be returned unopened to the Proposer. Sealed Technical Proposals are to be addressed and submitted to:

Susan D. Cobb

Massachusetts Bay Transportation Authority

Deputy General Counsel, Contracts and Procurement
Massachusetts Bay Transportation Authority
Ten Park Plaza, Suite 2810
Boston, MA 02116-3974

Sealed Financial Proposals are to be addressed and submitted to:

Susan D. Cobb c/o Joseph Sullivan
Hawkins Delafield & Wood LLP
7 World Trade Center
250 Greenwich Street
New York, NY 10007-2442

The MBTA may not consider any late Proposals. Proposals or modification requests received after the time for submittal of Proposals may be returned to Proposer without consideration or evaluation.

Each Proposer will be responsible for obtaining a written receipt appropriate to the means of delivery from the MBTA office specified in this Section at the time of delivery of its Proposal. It is the Proposer's sole responsibility to ensure delivery of its Proposal at the time and place specified herein and the MBTA will have no liability or responsibility therefore.

4.2.2 Number of Copies and Packaging of Proposals

Proposers shall submit, within sealed boxes or envelopes, one original and nine paper copies of their Technical Proposal (i.e. Volume 1 and Volume 2), as well as one electronic copy of the Technical Proposal. The electronic copy shall include, as separate files, all drawings in searchable PDF format and all narratives and Proposal Forms in Microsoft Word format.

The Proposer shall also submit one original and nine paper copies of its Financial Proposal (i.e. Volume 3), as well as one electronic copy of its Financial Proposal.

One set of the Proposal documents shall be clearly marked as the original and must contain the original signature forms and other original documents. Each copy of the Proposal shall have dividers where appropriate. The information provided in the electronic copies shall be arranged in the same manner as the hard copy of the Proposal. The typed, hardbound Financial and Technical Proposals shall take precedence over the electronic version. Proposers shall number each set of documents in sequential order on the upper right corner of each cover.

At the Proposer's option, Volume 1 of the Proposal may include three duplicate originals of the Stipend Agreement, signed by the Proposer.

The Proposal shall include the following information on the outside of the envelope or boxes: (a) name of Proposer, (b) "Proposal for AFC 2.0 Project" and (c) "[General Information and Technical Proposal]/[Financial Proposal]." Proposals will not be opened publicly.

4.3 Proposal Content

4.3.1 Proposal Volumes

Proposers must provide the following general information about their Proposals in Volume 1.

Volume 1 – General Information

Package 1 – Proposal Forms

Package 2 – Confirmation of SOQ and Executive Summary

Package 3 – Structure of the Proposer and relationship with the MBTA

The Technical Proposal must include the following information.

Volume 2 – Technical Proposal

Proposal Submittal Requirements set forth in Schedule F, as further described in Schedule C

The Financial Proposal must include the following information and should be in the order listed below:

Volume 3 – Financial Proposal

Package 1 – Financial Proposal Letter

Package 2 – Financial Statements and Credit Ratings

Package 3 – Financial Plan

Package 4 – Bid Financial Model

Package 5 – Miscellaneous

4.3.2 Required Forms

Failure to provide all information and all completed Proposal Forms in the format specified in Schedule A may result in the MBTA's rejection of the Proposal, or giving it a lower rating. All blank spaces in the Proposal forms must be filled in as noted and no changes may be made in the phraseology of the RFP or in the items mentioned therein. Any alterations, additions (other than expanding forms in order to properly include all required information or adding additional signature blocks to accommodate signatures from multiple Proposer Team members) or deletions made to the format of the Proposal Forms may render a Proposal non-responsive.

4.4 Proposal Format

Proposals must be prepared on 8-1/2" by 11" sized white paper and bound by volume. Double-sided printing is required. 11" by 17" pages are allowed for schematics, organizational charts and other drawings or schedules, but not for narrative text. The font size shall be no smaller than 12 point font, except for tables, which may be prepared using 10 point font. Printed lines may be single-spaced. Insofar as is practical or economical, all paper stock used shall be

composed of recycled materials. Proposers are encouraged to reduce the repetition of identical information within several sections of the Proposal by making appropriate and specific cross-references to other sections of their Proposal, however, no cross-references shall be permitted between the Technical Proposal and the Financial Proposal. Proposals shall be in the English language, and shall identify the unit of measurement being used. Sales brochures are not desired unless directly related to the Proposal and referenced in the text. Audiovisual materials will not be accepted unless in response to a specific MBTA request.

4.5 Limitations on Withdrawal or Modification of a Proposal

4.5.1 Modification of Proposals

Proposers may modify their Technical Proposals in writing prior to the specified time on the Technical Proposal Submittal Date, and their Financial Proposals in writing prior to the specified time on the Financial Proposal Submittal Date. The modification shall conform in all respects to the requirements for submission of a Proposal. Modifications shall be clearly delineated as such on the face of the document to prevent confusion with the original Proposal and shall specifically state that the modification supersedes the previous Proposal and all previous modifications, if any. If multiple modifications are submitted, they shall be sequentially numbered so MBTA can accurately identify the final Proposal. The modification must contain complete Proposal sections, complete pages or complete forms as described in Schedule A. Line item changes will not be accepted. No facsimile or other electronically transmitted modifications will be permitted.

4.5.2 Withdrawal of Proposals

The Proposer may withdraw its Technical Proposal prior to the Technical Proposal Submittal Date and its Financial Proposal prior to the Financial Proposal Submittal Date only by a written and signed request received by the Point of Contact. Following withdrawal of its Technical Proposal or Financial Proposal, the Proposer may submit a new Technical or Financial Proposal, provided that it is received by 2:00 pm (Eastern Time) on the Technical Proposal Submittal Date or Financial Proposal Submittal Date, respectively, and otherwise complies with the requirements of this RFP.

Each Technical Proposal shall not be withdrawn following the Technical Proposal Submittal Date, and each Financial Proposal shall not be withdrawn following the Financial Proposal Submittal Date. The Proposal shall remain effective for 180 calendar days following the Financial Proposal Submittal Date and shall be subject to adjustment solely in accordance with the Project Agreement. However, the MBTA may, in its sole discretion, release any Proposal prior to such date. Extensions of the 180-day period during which the Proposals shall remain open may only be made by agreement between the MBTA and any Proposer wishing to remain in contention for the award. If the Proposer wishing to remain in contention for the award fails to agree to any such extension, as conditioned in this paragraph, that Proposer shall be disqualified from further consideration for the award of the Project Agreement.

5. Proposal Evaluation

5.1 Responsiveness Review of Technical Proposals

The MBTA will conduct a preliminary review of Volume 1 and Volume 2 (the “Technical Proposals”) to assess responsiveness and to identify any aspect of the Technical Proposal that requires Clarification. Any Technical Proposal that the MBTA determines is incomplete in any material respect may be deemed non-responsive and rejected in its entirety. In such event, the MBTA may return the entire Technical Proposal to the Proposer. Materially responsive Technical Proposals will be evaluated based on:

- A) **RFP Terms and Conditions.** The Proposal has complied with all terms and conditions of this RFP, including, without limitation, all applicable submittal requirements specified in Schedule A.
- B) **Legal.** The Proposer has presented evidence showing that it is a legally constituted entity able to submit a Proposal and enter into and perform the Contract Services, and that the Proposer has obtained any certificates and licenses required by the RFP.

The review will also include any deletions or substitutions of Proposer Team members, changes in organization, changes or qualifications regarding the Project and the Project Agreement, and compliance with organizational requirements.

Proposers shall complete and submit all Proposal Forms. Failure to submit any such required forms may result in the Proposal being deemed non-responsive.

Proposals deemed responsive to these requirements will be evaluated as described in the following Sections of this RFP. Failure of any requirement listed above may result in rejection of the Proposal.

5.2 Evaluation of Technical Proposals

5.2.1 Technical Scoring

Following the Technical Proposal responsiveness review described above, the responsive Technical Proposals will be evaluated by the Selection Committee in accordance with the evaluation criteria set forth in Section 5.2.3 of this RFP. The score for the evaluation criteria set forth in Section 5.2.3 shall be summed to provide the Initial Technical Score. The Final Technical Score for each Proposal shall be determined based on the following calculation.

$$Final\ Technical\ Score_A = ITS_A \times TSF_x$$

Where:

ITS_A = Initial Technical Score = the sum of all technical scores from the technical evaluation topics identified below for the relevant Proposer

Massachusetts Bay Transportation Authority

TSF_x = Technical Score Factor = shall be derived from the Technical Score Range for the relevant Proposer from the below table:

| Technical Score Range (TSR) | Technical Score Factor (x) |
|-----------------------------|----------------------------|
| 0 – 75.0 | 100% |
| 75.1 – 125 | 65.0% |
| 125.1 – 175 | 37.5% |
| 175.1 – 250 | 10.0% |
| 250_+ | 0.0% |

Where:

$$TSR_A = ITS_{High} - ITS_A$$

Where:

ITS^A = the Initial Technical Score for the relevant Proposer

ITS_{High} = the highest Initial Technical Score included in a responsive Proposal

5.2.2 Weighting of Technical Evaluation Topics

In order to calculate the Initial Technical Score, each Proposal Submittal Requirement listed in the Master Submittals Checklist which has been evaluated pursuant to Section 5.2.1 will be assigned a rating of up to 5, using the guidelines set forth in Section 5.5.1 of this RFP. Based on the Project goals described in Section 2.3 of this RFP and the objectives identified in the Technical Requirements for each such topic, the ratings will be considered to determine the overall score for each technical evaluation topic.

| Technical Evaluation Topic | Score Multiplier (based on a maximum numerical score of 5, as set forth in Section 5.3) | Weighting | Highest Score Possible |
|---|--|------------------|-------------------------------|
| Team Organization and Team Qualifications | 12 | 10% | 60 |

Massachusetts Bay Transportation Authority

| | | | |
|---|--|--------|------------|
| | Highest Score Possible for Team Organization and Team Qualifications: | | 60 |
| General Project Understanding and Approach | 4 | 3.33% | 20 |
| | Highest Score Possible for General Project Understanding and Approach | | 20 |
| <i>Technical Requirements</i> | | | |
| Accessibility and Language | 8 | 6.67% | 40 |
| System Capabilities and Information Security | 16 | 13.33% | 80 |
| Implementation, Expansion, DB Oversight and Testing | 16 | 13.33% | 80 |
| Management, Maintenance and Reporting | 8 | 6.67% | 40 |
| Devices (excluding Gate Transition) | 8 | 6.67% | 40 |
| Readers | 6 | 5% | 30 |
| Quantity Standards and Retail | 6 | 5% | 30 |
| Privacy | 4 | 3.33% | 20 |
| Fare Card and Order Fulfillment | 4 | 3.33% | 20 |
| Revenue Collection and Remittance | 4 | 3.33% | 20 |
| Application Programming Interfaces | 4 | 3.34% | 20 |
| | Highest Score Possible for Technical Solutions Which Meet or Exceed the Technical Requirements: | | 420 |
| <i>DB Plans and Specifications</i> | | | |
| Device Lists and Quantities | 2 | 1.67% | 10 |
| Phase-In Plan | 2 | 1.66% | 10 |
| General Approach | 2 | 1.67% | 10 |
| Technical Approach | 2 | 1.67% | 10 |
| Interface Plan | 2 | 1.67% | 10 |

Massachusetts Bay Transportation Authority

| | | | |
|---|---|-------|------------|
| Gates | 2 | 1.66% | 10 |
| Station Validators | 2 | 1.67% | 10 |
| Fare Vending Machines | 2 | 1.67% | 10 |
| CN Equipment | 2 | 1.67% | 10 |
| Advancement Plan | 2 | 1.66% | 10 |
| | Highest Score Possible for DB Plans and Specifications | | 100 |
| | | | |
| Highest Technical Score Possible | | | 600 |

5.2.3 Technical Proposal Evaluation Criteria

The MBTA will evaluate the Technical Proposal based on the extent to which it satisfies each of the scored Proposal Submittal Requirements set forth in the Master Submittals Checklist (Schedule F). Responsive Technical Proposals which are deemed Technically Unacceptable, as further described in Section 5.5.1, will not be eligible for award.

Proposers shall not include any price information in their Technical Proposals. In the event that a Proposer's Technical Proposal is deemed nonresponsive, the Proposer's Financial Proposal will be returned to the Proposer unopened.

5.3 Responsiveness Review of Financial Proposals

Following the responsiveness review of the Technical Proposals, the MBTA will conduct a preliminary review of Volume 3 (the "Financial Proposal") to assess responsiveness and to identify any aspect of the Financial Proposal that requires Clarification. Any Financial Proposal that the MBTA determines is incomplete in any material respect may be deemed non-responsive and rejected in its entirety. In such event, the MBTA may return the entire Proposal to the Proposer. Materially responsive Proposals will be evaluated based on:

- A) **RFP Terms and Conditions.** The Proposal has complied with all terms and conditions of this RFP, including, without limitation, all applicable submittal requirements specified in Schedule A.
- B) **Financial Capacity.** The Proposer has presented updated information pertaining to its ability to meet the financial requirements of undertaking and performing its obligations under the Project Agreement. The Proposer's financial condition and capabilities shall not have materially adversely changed from its financial condition and capabilities as evidenced by the financial and other data submitted in the SOQ, such that the Proposer continues to have the financial capacity to provide the Contract Services, as determined by a review of the financial

information for each Proposer, both on its own merit and as compared to industry standards.

- C) **Security.** The Proposer has demonstrated its capability to undertake the security responsibilities associated with the Project Agreement, as determined by the delivery of Proposal Letter(s) of Credit, Surety Letters of Intent, and a Guarantor Acknowledgment, as further described herein. In addition, the Proposer has demonstrated how it will maintain working capital throughout the Term sufficient to perform the Contract Services. Working capital should be sufficient to meet any potential cost overruns and shortfalls estimated in the Financial Proposal.
- D) **Bid Financial Model.** The Proposer has provided a Bid Financial Model in Microsoft Excel format which is consistent with the Proposal Submittal Requirements set forth in the Proposer's Financial Plan and Section 3-19 through Section 3-22 of Schedule A.
- E) **Equity Commitment Terms.** The Proposer's Equity Members have provided a firm commitment (free of any material conditions, contingency or deviations) to provide their respective portions of the Equity Investment that the Financial Proposal dictates they will provide, and such equity commitment terms are consistent with the Bid Financial Model and their obligations under the RFP and the Project Agreement.
- F) **Debt Commitment Terms.** The Financial Proposal and Bid Financial Model is consistent with all terms provided in the Debt Commitment Letter(s).
- G) **Debt and Equity Commitment Amounts.** The Financial Proposal and Bid Financial Model demonstrates that: the aggregate amount of the debt commitment stated in the Debt Commitment Letters and the equity commitment stated in the evidence of the Equity Members' commitment meets or exceeds the amount of funds required to complete Systems Integrator's obligations under the Project Agreement.
- H) **Indicative Credit Rating.** If the Financial Plan assumes the issuance of any rated securities, the Financial Proposal includes indicative rating letter(s) showing the indicative rating(s) from the applicable Rating Service.
- I) **Lead Arranger.** If taxable bond or other private placement financing is included in the Financial Plan, the Financial Proposal includes evidence that the Lead Arranger on the Proposer's team has acted as a lead arranger on over \$500 million of comparable USD-denominated financings within the past five (5) years to finance infrastructure projects that were privately financed or delivered under public-private partnership frameworks or similar structure and had a rating in the "BBB+", "BBB" or "BBB-" categories."

The MBTA reserves the right to have members of the MBTA Consultant Support Team begin their responsiveness review of the Financial Proposals following the completion of the responsiveness review of the Technical Proposals but prior to the completion of the comparative evaluation of the Technical Proposals. In the event that the responsiveness review of the Financial Proposals begins prior to completion of the comparative evaluation of the Technical Proposals, the MBTA will implement procedures to ensure that the members of the MBTA Consultant Support Team conducting the responsiveness review of the Financial Proposals do not discuss the contents of the Financial Proposals with any MBTA employee or any member of the MBTA Consultant Support Team assisting in the evaluation of the Technical Proposals until the comparative evaluation of the Technical Proposals is complete. The MBTA may, in its sole discretion, request Clarification of some or all Proposals in accordance with Section 5.6. In addition, the MBTA may, in its sole discretion, perform other due diligence investigations with respect to any information submitted in a Proposal.

5.4 Price Proposal Scoring

Once the responsiveness review of the Financial Proposals is complete, the Price Proposals will be scored.

The score of a Price Proposal will be calculated in accordance with the formula set forth below. Each Price Proposal will be calculated on a net present value basis based on the combined cost of proposed Availability Payments and Expansion Payments.

$$Fin. Score_A = 2000 - \frac{AP_A - AP_{Low}}{\$450,000}$$

Where:

$Fin Score^A$ cannot be negative

AP^A = the present value of Availability Payments (Total NPV of APs for Entire Term as calculated in row (Z) of the Table 3A of the Proposal Form 14 (Financial Plan Summary Pro-Forma Tables)) for the relevant Proposer

AP_{Low} = the lowest present value of Availability Payments (Total NPV of APs for Entire Term as calculated in row (Z) of the Table 3A of the Proposal Form 14 (Financial Plan Summary Pro-Forma Tables)) included in a responsive Proposal

Massachusetts Bay Transportation Authority

5.5 Ratings Guidelines for the Technical Proposals and Overall Scoring

5.5.1 Ratings Guidelines for the Technical Proposals

Ratings for each technical evaluation criterion will be based on the following numerical scoring criteria:

| Score | Description |
|-------|--|
| 5 | <u><i>EXCELLENT</i></u> : The Proposer has presented and supported an approach that is considered to significantly exceed the stated criteria in a way that is beneficial to the MBTA. This rating indicates a consistently outstanding level of quality, with very little or no risk that this Proposer would fail to meet the requirements of the solicitation. There are no weaknesses. |
| 4 | <u><i>SATISFACTORY</i></u> : The Proposer has presented and supported an approach that is considered to meet the stated criteria. This rating indicates a generally acceptable quality, with little risk that this Proposer would fail to meet the requirements of the solicitation. Weaknesses, if any, are very minor and not material to the proposal. Correction of the weaknesses would not be necessary before the Proposal would be considered further. |
| 2 | <u><i>UNSATISFACTORY</i></u> : The Proposer has presented and supported an approach that meets the stated criteria but that contains weaknesses; examples of such weaknesses include no Proposer Team experience with the approach described in the Proposal, the approach lacks credibility, and the Proposal does not adequately address risks that are implied in the approach. This rating indicates a level of risk to the MBTA. |
| 1 | <u><i>POOR</i></u> : The Proposer has presented and supported an approach that fails to meet stated criteria and would pose a clear risk to the MBTA. The issues may be susceptible to correction through requests for Clarifications or discussions. Weaknesses exist that would need to be corrected before the Proposal would be considered further. |
| 0 | <u><i>DEFICIENT</i></u> : The Proposer has presented and supported an approach that indicates significant weaknesses or unacceptable quality, or fails to include evidence that it is capable of providing the services requested. The Proposal fails to meet the stated criteria or lacks essential information. There is no reasonable likelihood of success; weaknesses are so major or extensive that a major revision to the Proposal would be |

Massachusetts Bay Transportation Authority

| | |
|--|------------|
| | necessary. |
|--|------------|

Any Proposer receiving a score of zero for any of the technical evaluation topics shall be deemed to have submitted a Proposal which is Technically Unacceptable and will not be eligible for award. If a Proposer receives a score of one for more than four of the technical evaluation topics, the Proposer’s Proposal shall be deemed to be Technically Unacceptable and will not be eligible for award.

The ratings of each of the technical evaluation topics for the Proposal will be arrived at through a consensus process among the Selection Committee.

5.5.2 Computing Final Proposal Score

To calculate the final Proposal score, the Price Proposal score and the Technical Proposal score will be added together.

5.5.3 Revenue Forecasts

As indicated in Pro-Forma Table 5ii of Proposal Form 14, the MBTA has provided Proposers with revenue forecasts for purposes of pricing various transaction channels. These forecasts will be used solely for purposes of preparing and evaluating Proposals, and the Proposers shall not rely on these forecasts for any other purpose. The MBTA makes no representation as to the accuracy of such forecasts and shall not be responsible for any variance between such forecasts and the actual revenues during the performance of the Project Agreement.

5.6 MBTA Requests for Clarification

The Proposer shall provide accurate and complete information to the MBTA. If information is not complete, the MBTA may either declare the Proposal non-responsive or notify the Proposer that it will not be allowed to participate further in the procurement until all information required is provided. Any insufficient statements or incomplete affidavits may be returned directly to the Proposer by the MBTA with notations of the insufficiencies or omissions and with a request for Clarifications and/or submittal of corrected, supplemental, or missing documents. If a response is not provided prior to the deadline for submission of the response, the Proposal may be declared non-responsive.

The MBTA may waive minor irregularities in the form of the Proposal that do not alter the quality or quantity of the information provided.

The MBTA may, at its sole discretion, request Clarifications and/or supplemental information from Proposers during the Proposal evaluation process.

All requests for Clarification will be in writing via E-mail, with responses submitted as per the instructions contained in the request for Clarification by the deadline provided in the request for Clarification. Proposers should endeavor to answer each request for Clarification to the best of their ability, and shall provide an explanation in their response if they are unable to

adequately respond to the request for Clarification. Responses must be limited to answering the specific information requested by the MBTA.

The MBTA reserves the right to conduct interviews. If the MBTA elects to conduct interviews, the Proposers will be notified in writing.

In the event a material error is discovered in the RFP during the Proposal evaluation process, the MBTA will issue an Addendum to all Proposers that have submitted Proposals requesting revised Proposals based upon the corrected RFP.

5.7 Presentations and Interviews

The MBTA will conduct interviews on the dates set forth in Section 3.3.1. There will be one interview per Proposer Team and the interviews will be solely technical in nature. Each interview will last approximately three to four hours and will consist of the following: a presentation by Proposers on their design generally; a presentation on how the Proposers' proposed Customer-Facing Devices comply with the Project objectives and Proposal Submittal Requirements; and a question and answer session. During the portion of the presentation on the Proposer's general design, the MBTA may request that the Proposer address certain topics but otherwise the Proposer may select the topics on which the Proposer would like to present. Proposers will not be required to bring any proposed Customer-Facing Devices to the interview, but may use props, videos and visual aids. The MBTA will provide an agenda for the interview and further instructions to the Proposers via email no later than 10 business days prior to the date of the interview.

The interview itself will not be scored, but the Selection Committee will rely on the information it learns during the interview and, as described in Section 2.13, the findings and observations of the MBTA field team during both the demonstrations and Proposer reference project site visits to evaluate each of the items referenced in Section 5.2.3.

The MBTA reserves the right, in its sole discretion, to conduct multiple rounds of presentations and interviews, if it deems necessary to do so, with one or more Proposers.

6. MBTA Rights and Protest Procedures

6.1 MBTA Rights and Disclaimers

6.1.1 MBTA Rights

The MBTA reserves, without limitation, and may exercise at its discretion, the rights set forth below. These rights are in addition to and shall not limit any of the specific rights or conditions provided in this RFP. By responding to this RFP, Proposers acknowledge and consent to the MBTA's reservation of the following rights in effect before execution of the Project Agreement:

Massachusetts Bay Transportation Authority

- a) The right to modify or terminate the procurement process, including the right to decide not to award a Project Agreement as a result of this procurement, by written notice to the Proposers for any reason whatsoever;
- b) The right, for any reason, not to execute a Stipend Agreement or Project Agreement as a result of this procurement process;
- c) The right to waive any defect, technicality or any other error or irregularity in any Proposal or with respect to the procurement process;
- d) The right to make changes to the schedule of events associated with the procurement process upon notice to the Proposers;
- e) The right to reject any Proposal that is not responsive to the requirements of this RFP, or to disqualify any Proposer deemed to be unqualified during any stage of the procurement process, and to terminate the Proposer's Stipend Agreement;
- f) The right, at any time, to determine that any or all Proposers will not be qualified for further consideration upon notice to the Proposers of the MBTA's determination, and to terminate their Stipend Agreements;
- g) The right to require Proposers to provide representatives at places and times requested by the MBTA to meet with the MBTA and to answer questions and supplement or otherwise clarify matters for the MBTA;
- h) The right to disqualify any Proposer that changes its organization (as represented in its SOQ) without MBTA written approval;
- i) The right at any time to revise or eliminate one or more of the terms and services described in the Draft Project Agreement, or to include services not currently contemplated therein;
- j) The right, without prior notice, to supplement, amend or otherwise modify this RFP, including the Draft Project Agreement or Technical Requirements, issue Addenda or otherwise request additional information;
- k) The right to issue subsequent RFPs;
- l) The right throughout the procurement process to conduct investigations with respect to the qualifications and experience of each Proposer, or any Proposer Team member included in a Proposal, including the right to contact any references identified by the Proposer in its Proposal, and to request additional evidence to support any such information;
- m) The right to take any action affecting the RFP process, the Project Agreement, the Stipend Agreement or the Project that the MBTA determines to be in the MBTA's best interests, including the right to cancel this RFP in whole or in part with or

Massachusetts Bay Transportation Authority

without the substitution of another RFP if such cancellation is determined to be in the MBTA's best interests;

- n) The right to correspond with and receive written questions concerning this RFP from Proposers and to provide such questions, and the MBTA's responses, to some or all Proposers;
- o) The right to interview one or more of the Proposers, in the MBTA's sole discretion, in order to obtain clarification of information provided by the Proposer;
- p) The right of MBTA employees or other staff members, contractors, advisors, agents and representatives to visit and examine any of the projects referenced in the SOQ or Proposal and others owned, operated, designed or built by the Proposer to observe and inspect such projects and their operations;
- q) The right to request one or more best-and-final offers from two or more Proposers determined by the MBTA to have a reasonable chance of being selected as the Selected Proposer;
- r) The right to conduct Project Agreement negotiations with the Selected Proposer and the next highest ranked Proposer should the MBTA be unsuccessful in negotiating with the Selected Proposer;
- s) The right to appoint the selection and evaluation personnel to review Proposals and seek the assistance of outside technical experts in the Proposal evaluations, if necessary;
- t) The right to approve or disapprove the use of particular subcontractors, substitutions, or changes in Proposals;
- u) The right to decide on the most appropriate method for Project implementation, which may include discontinuation of this procurement process and development of the Project via another process elected by the MBTA;
- v) The right to modify, at any time before the Technical Proposal Submittal Date and via Addendum, the factors it will consider in evaluating the Technical Proposals and otherwise revise or expand its evaluation methodology;
- w) The right to modify, at any time before the Financial Proposal Submittal Date and via Addendum, the factors it will consider in evaluating the Financial Proposals and otherwise revise or expand its evaluation methodology; and
- x) The right to refuse to receive or open a Proposal, once submitted, or reject a Proposal if such refusal or rejection is based upon, but not limited to, the following:
 - 1) Failure on the part of the Proposer or a member of the Proposer's team to pay, satisfactorily settle or provide security for the payment of claims

Massachusetts Bay Transportation Authority

for labor, equipment, material, supplies or services legally due on previous or ongoing contracts with the MBTA;

- 2) Default on the part of the Proposer or a member of the Proposer's team under previous contracts with the MBTA;
- 3) Unsatisfactory performance by the Proposer or a member of the Proposer's team under previous contracts with the MBTA;
- 4) Issuance of a notice of debarment or suspension to the Proposer or a member of the Proposer's team;
- 5) Submission by the Proposer of more than one Proposal in response to this RFP under the Proposer's own name or under a different name;
- 6) Existence of an organizational conflict of interest or evidence of collusion between a prospective Proposer (or any member of the Proposer's team) and other Proposer(s) (or members of the Proposer's team) in the preparation of an SOQ, proposal or bid for any MBTA contract; or
- 7) Uncompleted work or default on a contract in another jurisdiction for which the prospective Proposer or a member of the Proposer's team is responsible which, in the judgment of the MBTA, might reasonably be expected to hinder or prevent the prompt and full performance of the Project Agreement, if awarded.

6.1.2 MBTA Disclaimers

In issuing this RFP and undertaking the procurement process contemplated hereby, the MBTA specifically disclaims the following:

- A) Any obligation to award or execute a Project Agreement pursuant to this RFP; and
- B) Any obligation to reimburse a Proposer who does not sign a Stipend Agreement or is otherwise disqualified or deemed non-responsive for any costs such Proposer incurs under this procurement.

In submitting a Proposal in response to this RFP, the Proposer is specifically acknowledging these disclaimers.

6.2 Protests

Bid appeals or protests relative to this procurement will be reviewed and adjudicated in accordance with the MBTA's Appeals/Protest Procedure – Goods & Services. A copy of this procedure is available by contacting the MBTA Procurement & Logistics Department, Room 2810, Ten Park Plaza, Boston, MA 02116.

Conformed through Addendum #19

PROPOSAL FORMS

2. The submittal of the Technical Proposal has been duly authorized by, and in all respects is binding upon, the Proposer. Attachment 1 to this transmittal letter is a Certificate of Authorization which evidences my authority to submit the Technical Proposal and bind the Proposer.
3. All firms currently included as part of the Proposer Team are identified in Proposal Form 2.
4. All Key Personnel not listed in the SOQ but which are currently included as part of the Proposer Team are identified in Proposal Form 3.
5. The Major Non-Equity Member's obligations under the Project Agreement will be guaranteed absolutely and unconditionally by the Guarantor, as evidenced by the Guarantor Acknowledgment certificate submitted as Proposal Form 11. Attachment 11A to Proposal Form 11 is a Certificate of Authorization, which evidences the signer's authority to submit the Guarantor Acknowledgment certificate and enter into a Guaranty Agreement with the MBTA.
6. All information and statements contained in the Proposal are current, correct and complete, and are made with full knowledge that the MBTA will rely on such information and statements in selecting the Selected Proposer and executing the Project Agreement.
7. No member of the Proposer Team is currently suspended or debarred from doing business with any governmental entity.
8. The Proposer has reviewed all of the engagements and pending engagements of the members of the Proposer Team and no potential exists for any conflict of interest or unfair advantage.
9. No Proposer Team member was a member of any short-listed respondent team competing to serve as the DB Entity under the DB RFQ.
10. No person or selling agency has been employed or retained to solicit the award of the Project Agreement under an arrangement for a commission, percentage, brokerage or contingency fee or on any other success fee basis, except bona fide employees of the members of the Proposer Team.
11. Proposer Team members have not engaged in any practices that may result in unlawful activity including, but not limited to, rebates, kickbacks, or other unlawful consideration in connection with the submittal of this Proposal.
12. The Proposer, or applicable Proposer Team Member, has all current and valid licenses, registrations and certificates required by applicable law to submit this Proposal and for provision of the services described in the RFP.

13. The principal contact person who will serve as the interface between the MBTA and the Proposer for all communications is:

NAME: _____
TITLE: _____
ADDRESS: _____

PHONE _____
FAX: _____
E-MAIL: _____

14. The key technical and legal representatives available to provide timely response to written inquiries submitted, and to attend meetings requested by the MBTA are:

Technical Representative:

NAME: _____
TITLE: _____
ADDRESS: _____

PHONE _____
FAX: _____
E-MAIL: _____

Legal Representative:

NAME: _____
TITLE: _____
ADDRESS: _____

PHONE _____
FAX: _____
E-MAIL: _____

15. The Draft Project Agreement in the form issued with the RFP, as amended, is agreed to and the Proposer has based its Proposal on such final Project Agreement.

16. If selected, the Proposer agrees to negotiate in good faith to enter into a Project Agreement that reflects the substantive terms and conditions of the RFP and the Proposal.
17. The Proposer has submitted all Technical Proposal Forms required to be submitted by the RFP and such Proposal Forms are a part of this Technical Proposal.
18. The Proposer has carefully examined all documents constituting the RFP and the addenda thereto and, being familiar with the work and the conditions affecting the work contemplated by the RFP and such addenda, offers to furnish all labor, materials, supplies, equipment, facilities and services which are necessary, proper or incidental to carry out such work as required by and in strict accordance with the RFP and the Proposal, all for the prices set forth in the Proposal Forms.
19. The Proposer understands that all costs and expenses incurred by it in preparing the Proposal and participating in the RFP process will be borne solely by the Proposer, except any Stipend that may be paid in accordance with the RFP.

Name of Proposer

Name of Designated Signatory

Signature

Title

PROPOSAL FORM 1B
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
AUTOMATED FARE COLLECTIONS SYSTEM PROJECT

Financial Proposal Transmittal Letter

(To be typed on Proposer's Letterhead)

[Date]

Re: Proposal for the AUTOMATED FARE COLLECTION SYSTEM Project

_____ (the "Proposer") hereby submits its Financial Proposal in response to the Request for Proposals for the Automated Fare Collection System Project ("RFP") issued by the Massachusetts Bay Transportation Authority ("MBTA") on November 15, 2016, as amended.

As a duly authorized representative of the Proposer, I hereby certify, represent, and warrant, on behalf of the Proposer Team and not in my personal capacity, as follows in connection with the Financial Proposal:

20. The Proposer acknowledges receipt of the RFP and the following addenda:

| <u>No.</u> | <u>Date</u> |
|------------|-------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

21. The submittal of the Financial Proposal has been duly authorized by, and in all respects is binding upon, the Proposer. Attachment 1 to this transmittal letter is a Certificate of Authorization which evidences my authority to submit the Proposal and bind the Proposer.
22. All members of our Proposer Team are identified in Proposal Form 2 of the Technical Proposal.
23. All Key Personnel are identified in Proposal Form 3 of the Technical Proposal.
24. The Major Non-Equity Member's obligations under the Project Agreement will be guaranteed absolutely and unconditionally by the Guarantor, as evidenced by the Guarantor Acknowledgment certificate submitted as Proposal Form 11. Attachment 11A to Proposal Form 11 is a Certificate of Authorization, which evidences the signer's authority to submit the Guarantor Acknowledgment certificate and enter into a Guaranty Agreement with the MBTA.
25. The Required Insurance required by the Project Agreement will be provided or brokered by _____, as evidenced by the Insurance Letter of Intent submitted on Proposal Form 10.
26. All information and statements contained in the Proposal are current, correct and complete, and are made with full knowledge that the MBTA will rely on such information and statements in selecting the Selected Proposer and executing the Project Agreement.
27. No member of the Proposer Team is currently suspended or debarred from doing business with any governmental entity.
28. The Proposer has reviewed all of the engagements and pending engagements of the members of the Proposer Team and no potential exists for any conflict of interest or unfair advantage.
29. No Proposer Team member was a member of any short-listed respondent team competing to serve as the DB Entity under the DB RFQ.
30. No person or selling agency has been employed or retained to solicit the award of the Project Agreement under an arrangement for a commission, percentage, brokerage or contingency fee or on any other success fee basis, except bona fide employees of the members of the Proposer Team.
31. Proposer Team members have not engaged in any practices that may result in unlawful activity including, but not limited to, rebates, kickbacks, or other unlawful consideration in connection with the submittal of this Proposal.

- 32. The Proposer, or applicable Proposer Team Member, has all current and valid licenses, registrations and certificates required by applicable law to submit this Proposal and for provision of the services described in the RFP.
- 33. The principal contact person who will serve as the interface between the MBTA and the Proposer for all communications is:

NAME: _____

TITLE: _____

ADDRESS: _____

PHONE: _____

FAX: _____

E-MAIL: _____

- 34. The Draft Project Agreement in the form issued with the RFP, as amended, is agreed to and the Proposer has based its Proposal on such final Project Agreement.
- 35. If selected, the Proposer agrees to negotiate in good faith to enter into a Project Agreement that reflects the substantive terms and conditions of the RFP and the Proposal.
- 36. The Proposer has submitted all Proposal Forms required to be submitted by the RFP and such Proposal Forms are a part of this Proposal.
- 37. The Proposer has carefully examined all documents constituting the RFP and the addenda thereto and, being familiar with the work and the conditions affecting the work contemplated by the RFP and such addenda, offers to furnish all labor, materials, supplies, equipment, facilities and services which are necessary, proper or incidental to carry out such work as required by and in strict accordance with the RFP and the Proposal, all for the prices set forth in the Proposal Forms.
- 38. The Proposer understands that all costs and expenses incurred by it in preparing the Proposal and participating in the RFP process will be borne solely by the Proposer, except any Stipend that may be paid in accordance with the RFP.

Name of Proposer

Name of Designated Signatory

Signature

Title

ACKNOWLEDGMENT BY NOTARY PUBLIC

(Notary Public)

State of _____

County of _____

On this ____ day of _____, 2017, before me appeared _____, personally known to me to be the person described in and who executed this Proposal Transmittal Letter and acknowledged that (she/he) signed the same freely and voluntarily for the uses and purposes therein described.

In witness thereof, I have hereunto set my hand and affixed by official seal the day and year last written above.

Notary Public in and for the state of

(SEAL)

(Name printed)

Residing at _____

My commission expires _____

Attachment 1

CERTIFICATE OF AUTHORIZATION*

I, _____, a resident of _____ in the State of _____, DO HEREBY CERTIFY that I am the Clerk/Secretary of _____, a corporation duly organized and existing under and by virtue of the laws of _____; that I have custody of the records of the corporation; and that as of the date of this certification, _____ holds the title of _____ the corporation, and is authorized to execute and deliver in the name and on behalf of the corporation the Proposal submitted by the corporation in response to the Request for Proposals for the AUTOMATED FARE COLLECTION SYSTEM Project issued on November 15, 2016, as amended; and all documents, letters, certificates and other instruments which have been executed by such officer on behalf of the corporation in connection therewith.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal of the corporation this _____ day of _____ 2017.

(Affix Seal Here)

Clerk/Secretary

* Note: Separate certifications shall be submitted if more than one corporate officer has executed documents as part of the Proposal. Proposers shall make appropriate conforming modifications to this Certificate in the event that the signatory's address is outside of the United States.

PROPOSAL FORM 2

PROPOSER TEAM MEMBER LIST

Name of Proposer Team (if any): _____

Provide the names and roles of firms included as part of the Proposer Team, including the Equity Member(s), Major Non-Equity Member(s), Guarantor, those entities performing the services identified in Section 1-2 of Schedule A, and all other firms currently identified as part of the Proposer Team. If one entity is expected to serve in more than one role, please provide the name of the entity for each role for which the entity is expected to serve.

| <u>NAME</u> | <u>ROLE</u> |
|-------------|--|
| _____ | <u>Major Non-Equity Member</u> |
| _____ | <u>Equity Member</u> _____ |
| _____ | <u>Guarantor</u> _____ |
| _____ | <u>Software/system development</u> |
| _____ | <u>Hardware development/supply</u> |
| _____ | <u>Hardware installation (Vehicle, etc.)</u> _____ |
| _____ | <u>System/software management, maintenance and configuration</u> |
| _____ | <u>Retail partnership development</u> |
| _____ | <u>Retail partnership management and stock delivery</u> |
| _____ | <u>DB Oversight</u> _____ |
| _____ | <u>Preliminary Design</u> _____ |
| _____ | <u>Web Design</u> _____ |
| _____ | <u>Web Maintenance</u> _____ |
| _____ | <u>UI Design</u> _____ |
| _____ | <u>Payment Service Provider(s)</u> _____ |
| _____ | <u>Hardware Maintenance</u> _____ |
| _____ | <u>Budgeting and Reporting</u> _____ |

PROPOSAL FORM 3

NEW KEY PERSONNEL

Provide the information requested on this form for each new Key Personnel who was not listed in the SOQ. Provide any changes to information on Key Personnel listed in the SOQ. Proposers may attach up to two additional pages if necessary.

Proposer Team: _____

Name: _____

Firm: _____

Title: _____

Years employed by firm: _____ years

Total Professional Experience _____ years

Professional Registration and Licenses (type/state/year/license number), if applicable: _____

Reference Project: _____

Involvement in Reference Project: _____

Reference Project: _____

Involvement in Reference Project: _____

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES Project-specific information

Title/Assignment _____

Description of Role/Responsibilities: _____

Time Commitment
to AFC 2.0
Project: _____%

PROPOSAL FORM 4

NEW PROPOSER TEAM MEMBERS

(Provide the information requested on this form for each new member of the Proposer Team who was not listed in the SOQ. Provide any changes to information on members of the Proposer Team listed in the SOQ. Attach additional pages if necessary.)

Name of Proposer: _____

| | |
|---|--------------------------|
| GENERAL INFORMATION | |
| Name: | |
| | |
| RELEVANT PROJECT EXPERIENCE | |
| Project: | |
| Location: | |
| Current Status: | |
| Dates of Involvement: | From _____ Through _____ |
| | |
| Description of Specific Roles and Responsibilities: | |
| | |
| Contact Person: | |
| Title: | |
| Address: | |
| Phone: | |
| Email Address: | |
| | |
| Project: | |
| Location: | |
| Current Status: | |
| Dates of Involvement: | From _____ Through _____ |
| | |
| Description of Specific Roles and Responsibilities: | |
| | |
| Contact Person: | |
| Title: | |

| | |
|----------------|--|
| Address: | |
| Phone: | |
| Email Address: | |

PROPOSAL FORM 5

RELATIONSHIP DISCLOSURE

This must be completed by each Proposer Team Member and Key Personnel (including firms and individuals).

The Proposer declares that:

1. The Proposer has reviewed the list of members of the Consultant Support Team.
2. The following is a full disclosure of all relationships that the Proposer has with:
 - a. any member of the Consultant Support Team or their current or former employees, shareholders, directors or officers; or
 - b. employees (both current or former) of the MBTA or individuals of firms who have been involved in the Selection Process or the Project (including developing specifications, evaluation factors or similar documents), that could constitute a conflict of interest or unfair advantage.

| Name of Party / Person | Details of the Nature of the Proposer's relationship with the listed Party/Person <i>(e.g. Proposer was an advisor to the member of the Consultant Support Team from 2008-2009)</i> |
|------------------------|--|
| | |
| | |
| | |

PROPOSAL FORM 6

STATEMENT OF OWNERSHIP

The Proposer is (check one):

Individual Partnership P.A. P.C. L.L.C. L.L.P.

Corporation Joint Venture Other (specify): _____

I certify that:

No individual person or entity owns a 10% or greater interest in the Proposer.

OR

The names and addresses of all persons and entities who own a 10% or greater interest in the Proposer are as follows:

NAME⁽¹⁾

ADDRESS

Check here if additional sheets are attached.

Check here to certify that no person or entity, **except for those already listed above or on any attached sheets**, owns a 10% or greater interest in the Proposer.

Name of Proposer

Designated Signatory

Signature

Title

(1): If an entity owns a 10 percent or greater interest in the Proposer, list all owners of 10 percent or greater interest for each such entity. Repeat the process of disclosure as necessary for each tier or level of ownership until the name and address of each individual person who owns a 10 percent or greater interest in each listed entity has been disclosed.

PROPOSAL FORM 7

**FORM OF COMMITMENT OF EQUITY MEMBERS, MAJOR NON-EQUITY MEMBERS,
PROJECT CONTRACTORS, SUBCONTRACTORS AND KEY PERSONNEL**

Proposer's Name: _____ (“Proposer”)

Proposer commits that, if awarded the Project Agreement to provide the design, implementation, integration, testing, financing, operations, maintenance and management services (the “Contract Services”) necessary to implement a new automated, account-based open-fare collections system (the “System”), collectively the project (the “Project”), the Proposer will use the entities and Key Personnel listed below for their stated positions and that, to the extent within the Proposer’s control, such entities and Key Personnel will be available on a full time basis for the periods necessary to fulfill their Project-related responsibilities.

Equity Member(s): _____

Major Non-Equity Member(s): _____

Project Contractor(s): _____

Project Subcontractors(s): _____

Technical Key Personnel: _____

Financial Key Personnel: _____

Signed: _____

Printed Name: _____

Title: _____

Date: _____

PROPOSAL FORM 8

FORM OF PROPOSAL LETTER OF CREDIT

IRREVOCABLE STANDBY LETTER OF CREDIT

ISSUER:

PLACE FOR PRESENTATION OF DRAFT:

(Name and Address of Bank/Branch – MUST be a domestic Qualified Commercial Bank or the Boston or New York branch or agency of a foreign Qualified Commercial Bank)

APPLICANT:

BENEFICIARY:

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

LETTER OF CREDIT NUMBER:

PLACE AND DATE OF ISSUE:

AMOUNT: *[Must be in an aggregate amount equal to three million United States dollars (US \$3,000,000)]*

EXPIRATION DATE: *[Must be no earlier than 10 Business Days following the Financial Close Deadline]*

The Issuer issues this Irrevocable Standby Letter of Credit in favor of the Massachusetts Bay Transportation Authority, for any sum or sums up to the aggregate amount of **Three Million United States Dollars (US \$3,000,000)**, available by draft at sight drawn on the Issuer. Any draft under this Irrevocable Standby Letter of Credit shall:

1. Identify this Irrevocable Standby Letter of Credit by the name of the Issuer, and the Letter of Credit number, amount, and place and date of issue; and
2. State one of the following:

“This drawing is due to _____ [Applicant’s Name] _____’s failure to perform any of the obligations listed in Section 3.20 of the Request for Proposals for the Automated Fare Collections System Services Project, issued on November 15, 2016, as amended, by the Massachusetts Bay Transportation Authority.

or

“This drawing is being made because we have been notified that the Letter of Credit will not be extended beyond the current expiration date and a satisfactory replacement has not been provided as of 14 days prior to the current expiration date.”

All drafts will be honored if presented to _____ [Name & Address] _____ on or before the Expiration Date described above or any extended expiration date.

Drawings by facsimile to facsimile number [() _____] are acceptable (each such drawing, a "Fax Drawing") provided, however, that a Fax Drawing will not be effectively presented until Beneficiary confirms, by telephone, Issuer's receipt of such Fax Drawing by calling Issuer at telephone number [() _____]. Issuer will acknowledge Beneficiary's presentment by e-mail to the e-mail address provided to Issuer in the Fax Drawing.

If a Demand for Payment is made by you hereunder at or prior to 10:00 a.m., Eastern time, on any weekday (i.e., Monday through Friday, excluding Commonwealth holidays and US federal holidays) (a "Business Day"), and provided that such Demand for Payment conforms to the terms and conditions hereof, payment shall be made by us to you in immediately available funds free and clear of and without deduction for any taxes, duties, fees, liens, set-offs or other deductions of any kind and regardless of any objection by any third party (subject to any court order or judgment), to the account designated below or such other account at a national bank in the United States of America that you may designate in the Demand for Payment on the next Business Day after demand is made. If a Demand for Payment is made by you hereunder after 10:00 a.m., Eastern time, on a Business Day, and provided that such Demand for Payment conforms to the terms and conditions hereof, such payment shall be made no later than our close of business, local time of the location of the account designated below or such other account at a national bank in the United States of America that you may designate in the Demand for Payment, on the second Business Day after demand is made. Payment under this Letter of Credit shall be made in same day funds, by wire transfer to your account described below or such other account as you may designate in writing.

This Letter of Credit shall be automatically extended for successive periods of one year, without amendment, from the stated expiration date and each extended expiration date unless we send the Massachusetts Bay Transportation Authority written notice of our intent not to extend the credit; which notice must be sent at least 30 days prior to the expiration date of the original term hereof or any extended one year term, by registered or certified mail or overnight courier, to Ten Park Plaza, Suite 2810, Boston MA 02116-3974, or any other address specified in writing to the Issuer at the above address by the Massachusetts Bay Transportation Authority. Notice to the Massachusetts Bay Transportation Authority that this Letter of Credit will not be extended, shall be deemed a default.

This Letter of Credit is subject to the rules of the "International Standby Practices" ISP98, if a conflict between ISP98 and Massachusetts law should arise, Commonwealth of Massachusetts law shall prevail, without regard to principals of conflicts of law.

Any failure by you to draw upon this Letter of Credit as permitted hereunder shall not cause this Letter of Credit to be unavailable for any future drawing, provided that this Letter of Credit has not expired prior to such future drawing and that all requirements of this Letter of Credit are independently satisfied with respect to any such future drawing.

[Select if the LOC issuer has an office in Massachusetts.] [If legal proceedings are initiated by any party with respect to payment of the Letter of Credit, we agree that such proceeding shall be subject to Massachusetts courts and law and the venue for such proceeding shall be in the Superior Court for the County of Suffolk, Massachusetts.]

[Select if the LOC issuer does not have an office in Massachusetts.] [If legal proceedings are initiated by any party with respect to payment of the Letter of Credit, we agree that such

proceeding shall be subject to New York courts and law and the venue for such proceeding shall be subject to jurisdiction and venue in the State of New York.]

Issuer: _____

By: _____
(Authorized signature of Issuer)

PROPOSAL FORM 9A

RESERVED

PROPOSAL FORM 9B

RESERVED

PROPOSAL FORM 10

INSURANCE LETTER OF INTENT

(to be typed on Insurance Provider's Letterhead)

Massachusetts Bay Transportation Authority
10 Park Plaza, Suite 2810
Boston, MA 02116-3974
Attention: Susan D. Cobb, Deputy General Counsel, Contracts and Procurement

Re: Proposal for Automated Fare Collections System Services Project

Dear Ms. Cobb,

Reference is made to that certain Request for Proposals for the Automated Fare Collections System Services Project through a Project Agreement issued by the Massachusetts Bay Transportation Authority (the "MBTA") on November 15, 2016 (as amended, the "RFP"). Initially capitalized terms not otherwise defined herein shall have the meanings set forth in the current RFP version of the Project Agreement, to be entered into between the Selected Proposer (as "Systems Integrator") and the MBTA (the "Project Agreement"), in accordance with the RFP.

As part of the Proposal by [_____] [Insert Proposer Name] ("Proposer"), and with respect to Article 17 of the Project Agreement and Appendix 12, I confirm that

1. The Proposal (with respect to Insurance Policies) conforms to the requirements of the Project Agreement and, in particular, Article 17 thereof and Appendix 12 thereto;
2. The amount proposed by Proposer in its Financial Proposal for the premiums and cost of such Insurance Policies for the first year after the Full Service Commencement Date, as shown in the Bid Financial Model and related Financial Model data, reflects the current and fair market cost of providing all such Insurance Policies, collectively and as to each individually; and
3. I am a licensed insurance [broker]/[consultant] [Proposer to use correct term for signatory's role/title] in the State of _____ [Insert State(s) Licensed]. I have been retained by Proposer to serve as its independent insurance [broker]/[consultant] with respect to the Automated Fare Collections System Services Project and for the purposes of making this confirmation. I have been duly authorized by Proposer and my firm to make such confirmation to the MBTA, recognizing that the MBTA intends to rely on the same for purposes of evaluation of the Proposals and for application under the Agreement.

Based upon its understanding of the Required Insurance set forth in the RFP, all such coverages included as Required Insurance are currently available in the insurance marketplace or are presently addressed by the Proposer's corporate insurance program. The Insurance Provider hereby certifies that it intends to work with the Proposer to provide all Required Insurance set forth in this RFP in the event the Proposer is approved by the MBTA for final negotiations and execution of the Project Agreement.

Name of Insurance Provider

Name of Authorized Signatory

Signature

Title

PROPOSAL FORM 11

GUARANTOR ACKNOWLEDGMENT

(to be typed on Guarantor's Letterhead)

_____ ("the Proposer") has submitted herewith a Proposal in response to the MBTA's November 15, 2016 Request for Proposals for the AUTOMATED FARE COLLECTIONS SYSTEM SERVICES Project, as amended (the RFP) pursuant to which it is seeking to be selected by the MBTA to provide the Contract Services described in the RFP.

The Guarantor hereby certifies that it will irrevocably, absolutely and unconditionally guarantee pursuant to a Guaranty Agreement the performance of all of the _____'s (the "Project Contractor") obligations under the Project Contract to which the Project Contractor is a party, in the event the Proposer is selected for execution of the Project Agreement by the MBTA.

Name of Guarantor

Name of Authorized Signatory

Signature

Title

**If more than one Guarantor is proposed, each Guarantor shall provide an executed copy of this Guarantor Acknowledgment.*

Attachment 11A

GUARANTOR CERTIFICATE OF AUTHORIZATION*

I, _____, a resident of _____ in the State of _____ DO HEREBY CERTIFY that I am the Clerk/Secretary of _____, a corporation duly organized and existing under and by virtue of the laws of the State of _____; that I have custody of the records of the corporation; and that as of the date of this certification, _____ holds the title of _____ of the corporation, and is authorized to execute and deliver in the name and on behalf of the corporation the Guarantor Acknowledgment submitted by the corporation as part of _____ ("the Proposer's") response to the Request for Proposals for the AUTOMATED FARE COLLECTION SYSTEM SERVICES Project issued by the Massachusetts Bay Transportation Authority on November 15, 2016, as amended; and all documents, letters, certificates and other instruments which have been executed by such officer on behalf of the corporation in connection therewith.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal of the corporation this _____ day of _____, 2017.

(Affix Seal Here)

(Clerk/Secretary)

**Note: Separate certifications shall be submitted if more than one corporate officer has executed the Guarantor Acknowledgment as part of the Proposal. Proposers shall make appropriate conforming modifications to this Certificate in the event the signatory's address is outside of the United States.*

PROPOSAL FORM 12

PROJECT AGREEMENT COMMENTS FORM

| Section | Proposed Change (including detailed drafting) | Reasons for Proposed Change | Net cost savings to MBTA, if applicable |
|---------|---|--------------------------------|--|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

PROPOSAL FORM 13

FINANCIAL PROPOSAL LETTER

Summary Financial Information for all Equity Members, Major Non-Equity Members and Guarantors of the Proposer for the Most Recently Completed Fiscal Year

[Insert Name of Entity]

| Fiscal Year | Role/Responsibility Within the Proposer Team | Total Revenues | Earnings from Operations (EBITDA) | Interest Expense | Net Income | Current Assets | Cash & Cash Equivalents | Accounts Receivable | Other Current Assets (d) | Total Assets (d) | Current Liabilities | Current Portion of Long-Term Debt | Long-Term Debt | Total Debt | Total Equity (e) | Gearing (f) |
|-------------|--|----------------|-----------------------------------|------------------|------------|----------------|-------------------------|---------------------|--------------------------|------------------|---------------------|-----------------------------------|----------------|------------|------------------|-------------|
| [FY XXXX] | [Equity Member] | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Notes:

- (A) Complete separate forms for each Equity Member, Major Non-Equity Member and Guarantor of the Proposer.
- (B) Information should be derived from audited financial statements where possible. Audited financial statements will prevail over this table.
- (C) Amounts should be expressed in thousands (000s) of United States Dollars. Where applicable, companies should indicate the conversion to United States Dollars, using the exchange rate prevailing on the last day of the applicable fiscal year as published in the Wall Street Journal or other publicly available source.
- (D) Current Assets excluding Cash & Cash Equivalents, Accounts Receivable, and Inventories.
- (E) Excludes goodwill and intangibles.
- (F) Long-Term Debt/Total Equity.

I hereby certify that the foregoing is complete, true and correct, and that I am the [Chief Financial Officer][Treasurer][Other Equivalent Title]¹ of the entity to which this form pertains:

By: _____ Date: _____

Name: _____

¹ If positions of Chief Financial Officer or Treasurer does not exist for an entity, an individual who serves in an equivalent capacity and whose title shall be specified in the certification

PROPOSAL FORM 14

FINANCIAL PLAN SUMMARY

Beginning with Addendum #11, Proposal Form 14 will no longer be provided as both a Microsoft Word document and a Microsoft Excel workbook. Please use the Microsoft Excel workbook to complete Proposal Form 14.

Pro-Forma Table 1A – Quarterly Implementation Period Sources and Uses Analysis¹

| Quarterly Uses of Funds | | | | | | | | | | | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------|
| Fiscal Years | Q3 FY2018 | Q4 FY2018 | Q1 FY2019 | Q2 FY2019 | Q3 FY2019 | Q4 FY2019 | Q1 FY2020 | Q2 FY2020 | Q3 FY2020 | Q4 FY2020 | Q1 FY2021 | Q2 FY2021 | Q3 FY2021 | Q4 FY2021 | Q1 FY2022 | Total |
| A. Implementation Work expenditures | | | | | | | | | | | | | | | | |
| B. Development and pursuit costs | | | | | | | | | | | | | | | | |
| C. O&M During Implementation Expenditures | | | | | | | | | | | | | | | | |
| D1. Implementation Period SPV Costs (excludes D2) | | | | | | | | | | | | | | | | |
| D2. Insurance expenses | | | | | | | | | | | | | | | | |
| E. Cash Taxes (as shown in the Bid Financial Model) | | | | | | | | | | | | | | | | |
| F. Ongoing financing fees | | | | | | | | | | | | | | | | |
| G1. Interest expense | | | | | | | | | | | | | | | | |
| G2. Debt principal repayment | | | | | | | | | | | | | | | | |
| H. Dividends | | | | | | | | | | | | | | | | |
| I. Reserves accounts funding amounts | | | | | | | | | | | | | | | | |
| J. Other uses (please describe) | | | | | | | | | | | | | | | | |
| K. Total Uses of Funds | | | | | | | | | | | | | | | | |
| L. Total Sources of Funds | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| Quarterly Sources of Funds | | | | | | | | | | | | | | | | |
| Fiscal Years | Q3 FY2018 | Q4 FY2018 | Q1 FY2019 | Q2 FY2019 | Q3 FY2019 | Q4 FY2019 | Q1 FY2020 | Q2 FY2020 | Q3 FY2020 | Q4 FY2020 | Q1 FY2021 | Q2 FY2021 | Q3 FY2021 | Q4 FY2021 | Q1 FY2022 | Total |
| M1. Senior Debt draws | | | | | | | | | | | | | | | | |
| M2. Other mezzanine/subordinated debt draws | | | | | | | | | | | | | | | | |
| N1. Equity Investment contributions | | | | | | | | | | | | | | | | |
| N2. Equity bridge loans | | | | | | | | | | | | | | | | |
| O. Interest income during Implementation Period | | | | | | | | | | | | | | | | |
| Quarterly Equity Investment and Implementation Equity Ratio | | | | | | | | | | | | | | | | |
| Fiscal Years | Q3 FY2018 | Q4 FY2018 | Q1 FY2019 | Q2 FY2019 | Q3 FY2019 | Q4 FY2019 | Q1 FY2020 | Q2 FY2020 | Q3 FY2020 | Q4 FY2020 | Q1 FY2021 | Q2 FY2021 | Q3 FY2021 | Q4 FY2021 | Q1 FY2022 | Total |
| N. Equity Investment contributions & bridge loans (N1 N2) | | | | | | | | | | | | | | | | |
| P. Deferred Equity LCs | | | | | | | | | | | | | | | | |
| Q. Committed Equity Investment (Q N P) | | | | | | | | | | | | | | | | |
| R. Project Debt and Committed Equity Investment (R M O) | | | | | | | | | | | | | | | | |
| S. Implementation Equity Ratio (S Cumulative Q/ Cumulative R) | | | | | | | | | | | | | | | | N/A |

(1) Proposers are required to provide information Fiscal Years

Pro-Forma Table 1B – Annual Implementation Period Sources and Uses Analysis¹

Annual Uses of Funds

| | Fiscal Years ¹ | FY 2018 | FY 2019 | FY 2020 | FY 2021 | Total |
|--|---------------------------|---------|---------|---------|---------|-------|
| A. Design & Implementation expenditures (excluding A2) | | | | | | |
| B. Development and pursuit costs | | | | | | |
| C. O&M During Implementation Expenditures | | | | | | |
| D1. Implementation Period SPV Costs (excludes D2) | | | | | | |
| D2. Insurance expenses | | | | | | |
| E. Cash Taxes (as shown in the Bid Financial Model) | | | | | | |
| F. Ongoing financing fees | | | | | | |
| G1. Interest expense | | | | | | |
| G2. Debt principal repayment | | | | | | |
| H. Dividends | | | | | | |
| I. Reserves accounts funding amounts | | | | | | |
| J. Other uses (<i>please describe</i>) | | | | | | |
| K. Total Uses of Funds | | | | | | |

| | | | | | | |
|----------------------------------|--|--|--|--|--|--|
| L. Total Sources of Funds | | | | | | |
|----------------------------------|--|--|--|--|--|--|

Annual Sources of Funds

| | Fiscal Years ¹ | FY 2018 | FY 2019 | FY 2020 | FY 2021 | Total |
|---|---------------------------|---------|---------|---------|---------|-------|
| M1. Senior Debt draws | | | | | | |
| M2. Other mezzanine/subordinated debt draws | | | | | | |
| N1. Equity Investment contributions | | | | | | |
| N2. Equity bridge loans | | | | | | |
| O. Interest income during Implementation Period | | | | | | |

P. Annual Equity Investment and Implementation Equity Ratio

| | Fiscal Years ¹ | FY 2018 | FY 2019 | FY 2020 | FY 2021 | Total |
|---|---------------------------|---------|---------|---------|---------|-------|
| N. Equity Investment contributions & bridge loans (N1 + N2) | | | | | | |
| Q. Deferred Equity LCs | | | | | | |
| R. Committed Equity Investment (R = N + Q) | | | | | | |
| S. Project Debt and Committed Equity Investment (S = M + R) | | | | | | |

| | | | | | | |
|---|--|--|--|--|--|-----|
| T. Implementation Equity Ratio (T = Cumulative R/Cumulative S) | | | | | | N/A |
|---|--|--|--|--|--|-----|

(1) Proposers are required to provide information Fiscal Years

Pro-Forma Table 2 – Operating Period Capital Structure¹

| Fiscal Years¹ | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | FY 2026 | FY 2027 | FY 2028 | FY 2029 | FY 2030 | FY 2031 | FY 2032 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Outstanding balances at beginning of period | | | | | | | | | | | | | | | |
| Equity Investment (excluding Subordinate Debt) | | | | | | | | | | | | | | | |
| Subordinate Debt | | | | | | | | | | | | | | | |
| Deferred Equity LCs | | | | | | | | | | | | | | | |
| Total Committed Equity Investment at beginning of period | | | | | | | | | | | | | | | |
| Outstanding balances at beginning of period | | | | | | | | | | | | | | | |
| Senior Debt | | | | | | | | | | | | | | | |
| Other mezzanine/subordinated debt | | | | | | | | | | | | | | | |
| Total outstanding Project Debt balance at beginning of period | | | | | | | | | | | | | | | |

(1) Proposers are required to provide information Fiscal Years

Pro-Forma Table 2 – Operating Period Capital Struct

| Fiscal Years¹ | FY 2033 | FY 2034 | FY 2035 | FY 2036 | FY 2037 | FY 2038 | FY 2039 | FY 2040 | FY 2041 |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Outstanding balances at beginning of period | | | | | | | | | |
| Equity Investment (excluding Subordinate Debt) | | | | | | | | | |
| Subordinate Debt | | | | | | | | | |
| Deferred Equity LCs | | | | | | | | | |
| Total Committed Equity Investment at beginning of period | | | | | | | | | |
| Outstanding balances at beginning of period | | | | | | | | | |
| Senior Debt | | | | | | | | | |
| Other mezzanine/subordinated debt | | | | | | | | | |
| Total outstanding Project Debt balance at beginning of period | | | | | | | | | |

(1) Proposers are required to provide information Fiscal Y

Pro-Forma Table 3A – Financial Plan Overview

| Key Dates & Assumptions | |
|--|-----------|
| Estimated Financial Close Date | 1-Feb-18 |
| Financial Close Deadline | 21-Mar-18 |
| Revenue Service Commencement Date | 1-May-20 |
| Transition Period Completion | 1-Aug-20 |
| Scheduled Full Service Commencement Date | 1-May-21 |
| Initial Term Expiration Date | 20-Mar-31 |
| Renewal Term 1 Expiration Date | 20-Mar-36 |
| Renewal Term 2 Expiration Date | 20-Mar-41 |
| CPI-U | 2.50% |

| Net Present Value of Availability Payments⁽¹⁾ | | |
|---|--|---------------|
| Initial Term | | |
| A | NPV APC (Initial Term @ 5%) | \$0.00 |
| B | NPV APO (Initial Term @ 5%) | \$0.00 |
| C | NPV Allowable AP Transaction Rates (% MBTA Fare Revenue) (%) (8 Years @ 5%) | \$0.00 |
| D | NPV Other AP Transaction Rates (% MBTA Fare Revenue) (%) (Initial Term @ 5%) | \$0.00 |
| E | NPV Allowable AP Transactions Rate (\$ per Transaction Unit) (\$) (8 Years @ 5%) | \$0.00 |
| F | NPV Other AP Transaction Rate (\$ per Transaction Unit) (\$) (Initial Term @ 5%) | \$0.00 |
| G | Total Value for Initial Term (A + B + C + D + E + F) | \$0.00 |
| Unplanned Scenarios | | |
| H | NPV EAPO (Initial Term @ 13%) | \$0.00 |
| I | Total Value of Unplanned Labor (Proposal Form 6B) | \$0.00 |
| J | Total Value Unplanned Scenarios (H + I) | \$0.00 |
| Renewal Terms | | |
| V | NPV APO (Renewal Term @ 13%) | \$0.00 |
| W | NPV Other AP Transaction Rate (%) (Renewal Term @ 13%) | \$0.00 |
| X | NPV Other AP Transaction Rate (\$) (Renewal Term @ 13%) | \$0.00 |
| Y | Total NPV of APs for Renewal Term (V + W + X) | \$0.00 |
| Z | Total NPV of APs for Entire Term (Price Proposal Evaluation) (G + J + Y) | \$0.00 |

| Key Equity Metrics | |
|--|--|
| Implementation Equity Ratio (% upon Full Service Commencement) | |
| Total Committed Equity Investment amount (nominal Dollars) | |
| Bid Equity IRR (%) | |
| Year of first equity distribution | |
| Year of nominal equity payback | |

| Key Debt Metrics | |
|---|--|
| Maximum Project Debt amount (nominal Dollars) | |
| Weighted Average Cost of Debt (%) | |
| Project Debt Coverage Ratios | |
| Minimum DSCR | |
| Average DSCR | |
| Minimum PLCR | |
| Average PLCR | |
| Minimum LLCR | |
| Average LLCR | |
| Senior Debt Coverage Ratios | |
| Minimum DSCR | |
| Average DSCR | |
| Minimum LLCR | |
| Average LLCR | |

(1) Calculated as of estimated Financial Close Date

Pro-Forma Table 3B (i) – Bank Debt Financing Data¹

| Project Debt facility | Amount | Benchmark Index and Maturity | Base Interest Rate(s) (%) | Credit Margin (%) | Total Interest Rate (%) | Weighted Average Maturity | Debt term | Upfront Fees | Commitment Fees | Principal or interest deferral period |
|-----------------------|--------|------------------------------|---------------------------|-------------------|-------------------------|---------------------------|-----------|--------------|-----------------|---------------------------------------|
| | | | | | | | | | | |

(1) Only applicable if bank financing is used

Pro-Forma Table 3B (ii) – Bond Financing Data¹

| Project Debt facility | Amount | Benchmark Index | Maturity | Benchmark Interest Rate(s) | Yield |
|------------------------------|---------------|------------------------|-----------------|-----------------------------------|--------------|
| | | | | | |

| Summary of Make Whole Provisions |
|---|
| |

(1) (only applicable if bond financing is used)

Pro-Forma Table 3C – Debt Coverage Ratios¹

| Fiscal Years | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | FY 2026 | FY 2027 | FY 2028 | FY 2029 | FY 2030 | FY 2031 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Project Debt Coverage Ratios | | | | | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | | | | | |
| Total Project Debt service and fees | | | | | | | | | | | | | | |
| Debt Service Coverage Ratio (DSCR) | | | | | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | | | | | |
| Annual Weighted Average Project Debt Cost | | | | | | | | | | | | | | |
| Net present value of CFADS | | | | | | | | | | | | | | |
| End of period outstanding Project Debt | | | | | | | | | | | | | | |
| Loan Life Coverage Ratio (LLCR) | | | | | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | | | | | |
| Annual Weighted Average Project Debt Cost | | | | | | | | | | | | | | |
| Net present value of CFADS | | | | | | | | | | | | | | |
| End of period outstanding Project Debt | | | | | | | | | | | | | | |
| Project Life Coverage Ratio (PLCR) | | | | | | | | | | | | | | |
| Senior Debt Coverage Ratios | | | | | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | | | | | |
| Total Project Debt service and fees | | | | | | | | | | | | | | |
| Debt Service Coverage Ratio (DSCR) | | | | | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | | | | | |
| Annual Weighted Average Project Debt Cost | | | | | | | | | | | | | | |
| Net present value of CFADS | | | | | | | | | | | | | | |
| End of period outstanding Project Debt | | | | | | | | | | | | | | |
| Loan Life Coverage Ratio (LLCR) | | | | | | | | | | | | | | |

(1) Proposers are required to provide information Fiscal Years

Pro-Forma Table 3C – Debt Coverage Ratios¹

| Fiscal Years | FY 2032 | FY 2033 | FY 2034 | FY 2035 | FY 2036 | FY 2037 | FY 2038 | FY 2039 | FY 2040 | FY 2041 |
|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Project Debt Coverage Ratios | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | |
| Total Project Debt service and fees | | | | | | | | | | |
| Debt Service Coverage Ratio (DSCR) | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | |
| Annual Weighted Average Project Debt Cost | | | | | | | | | | |
| Net present value of CFADS | | | | | | | | | | |
| End of period outstanding Project Debt | | | | | | | | | | |
| Loan Life Coverage Ratio (LLCR) | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | |
| Annual Weighted Average Project Debt Cost | | | | | | | | | | |
| Net present value of CFADS | | | | | | | | | | |
| End of period outstanding Project Debt | | | | | | | | | | |
| Project Life Coverage Ratio (PLCR) | | | | | | | | | | |
| Senior Debt Coverage Ratios | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | |
| Total Project Debt service and fees | | | | | | | | | | |
| Debt Service Coverage Ratio (DSCR) | | | | | | | | | | |
| Cash Flow Available for Debt Service (CFADS) | | | | | | | | | | |
| Annual Weighted Average Project Debt Cost | | | | | | | | | | |
| Net present value of CFADS | | | | | | | | | | |
| End of period outstanding Project Debt | | | | | | | | | | |
| Loan Life Coverage Ratio (LLCR) | | | | | | | | | | |

(1) Proposers are required to provide information Fis

Pro-Forma Table 3D – Cash-Funded Reserves (or Letters of Credit)¹

| Fiscal Years ² | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | FY 2026 | FY 2027 | FY 2028 | FY 2029 | FY 2030 | FY 2031 |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| DEBT SERVICE RESERVE ACCOUNT | | | | | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | | | | | |
| Ending Balance | | | | | | | | | | | | | | |
| MAJOR MAINTENANCE RESERVE ACCOUNT | | | | | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | | | | | |
| Ending Balance | | | | | | | | | | | | | | |
| HANDBACK REQUIREMENTS RESERVE | | | | | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | | | | | |
| Ending Balance | | | | | | | | | | | | | | |
| VANDALISM RESERVE ACCOUNT | | | | | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | | | | | |
| Ending Balance | | | | | | | | | | | | | | |
| EXTERNAL INTERFACES RESERVE ACCOUNT | | | | | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | | | | | |
| Ending Balance | | | | | | | | | | | | | | |
| UNPLANNED EXPANSIONS RESERVE ACCOUNT | | | | | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | | | | | |
| Ending Balance | | | | | | | | | | | | | | |

(1) Add additional reserve accounts as necessary
(2) Proposers are required to provide information Fiscal Years

Pro-Forma Table 3D – Cash-Funded Reserves (or L

| Fiscal Years ⁽²⁾ | FY 2032 | FY 2033 | FY 2034 | FY 2035 | FY 2036 | FY 2037 | FY 2038 | FY 2039 | FY 2040 | FY 2041 |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| DEBT SERVICE RESERVE ACCOUNT | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | |
| Ending Balance | | | | | | | | | | |
| MAJOR MAINTENANCE RESERVE ACCOUNT | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | |
| Ending Balance | | | | | | | | | | |
| HANDBACK REQUIREMENTS RESERVE | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | |
| Ending Balance | | | | | | | | | | |
| VANDALISM RESERVE ACCOUNT | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | |
| Ending Balance | | | | | | | | | | |
| EXTERNAL INTERFACES RESERVE ACCOUNT | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | |
| Ending Balance | | | | | | | | | | |
| UNPLANNED EXPANSIONS RESERVE ACCOUNT | | | | | | | | | | |
| Beginning Balance | | | | | | | | | | |
| Deposits to Reserve | | | | | | | | | | |
| Interest Earnings | | | | | | | | | | |
| Draws/release of Reserve | | | | | | | | | | |
| Ending Balance | | | | | | | | | | |

(1) Add additional reserve accounts as necessary
 (2) Proposers are required to provide information Fiscal

Pro-Forma Table 4 – Sensitivity Analysis (Initial Term Only)

| Variable | Sensitivity Conducted | Total Value of Initial Term (PV @ 5%) ² | Bid Equity IRR (%) | Project Debt Average / Min DSCR | Senior Debt Average / Min DSCR |
|--|-----------------------|--|-----------------------|---------------------------------|--------------------------------|
| Baseline Financial Plan | | [from Price Proposal] | [from Price Proposal] | [from Pro-Forma Table 3A] | [from Pro-Forma Table 3A] |
| (a) Sensitivities prior to financial close | | | | | |
| Benchmark Interest Rate fluctuation | 50bp reduction | | [from Price Proposal] | | |
| | 25bp reduction | | | | |
| | 25bp increase | | | | |
| | 50bp increase | | | | |
| | 75bp increase | | | | |
| | 100bp increase | | | | |
| Option Pricing & Evaluation Scenarios ¹ | No 1 | | | | |
| | No 2 | | | | |
| | No 3 | | | | |
| (b) Sensitivities post financial close | | | | | |
| Increases in Implementation Work costs | 5% Increase | [from Price Proposal] | | | |
| | 10% Increase | | | | |
| Increases in Operating Services costs | 5% Increase | | | | |
| | 10% Increase | | | | |
| Fare Revenue | 15% reduction | | | | |
| | 15% increase | | | | |
| Standard Fare Card Enablements | 25% reduction | | | | |
| | 25% increase | | | | |
| Milestones | 1-month early | | | | |
| | 3-month early | | | | |
| | 6-month early | | | | |
| | 1-month delay | | | | |
| | 3-month delay | | | | |
| | 6-month delay | | | | |

(1) Provide total amounts for base award and option pricing required per Pro-Forma Table 7

(2) Present Value to be calculated consistently with Item G of Table 3A

Pro-Forma Table 5 – Price Proposal Form (Nominal \$)

1. Input Table - PLEASE COMPLETE

| Term | FC | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | |
|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Quarter Starting | Jan 01 2018 | Apr 01 2018 | Jul 01 2018 | Oct 01 2018 | Jan 01 2019 | Apr 01 2019 | Jul 01 2019 | Oct 01 2019 | Jan 01 2020 | Apr 01 2020 | Jul 01 2020 | Oct 01 2020 | Jan 01 2021 | Apr 01 2021 | Jul 01 2021 | Oct 01 2021 | Jan 01 2022 | Apr 01 2022 | Jul 01 2022 | Oct 01 2022 | Jan 01 2023 | Apr 01 2023 | Jul 01 2023 | Oct 01 2023 | Jan 01 2024 | Apr 01 2024 | Jul 01 2024 | Oct 01 2024 | Jan 01 2025 | Apr 01 2025 | Jul 01 2025 | Oct 01 2025 | Jan 01 2026 | Apr 01 2026 | Jul 01 2026 | Oct 01 2026 |
| Quarter Ending | Mar 31 2018 | Jun 30 2018 | Sep 30 2018 | Dec 31 2018 | Mar 31 2019 | Jun 30 2019 | Sep 30 2019 | Dec 31 2019 | Mar 31 2020 | Jun 30 2020 | Sep 30 2020 | Dec 31 2020 | Mar 31 2021 | Jun 30 2021 | Sep 30 2021 | Dec 31 2021 | Mar 31 2022 | Jun 30 2022 | Sep 30 2022 | Dec 31 2022 | Mar 31 2023 | Jun 30 2023 | Sep 30 2023 | Dec 31 2023 | Mar 31 2024 | Jun 30 2024 | Sep 30 2024 | Dec 31 2024 | Mar 31 2025 | Jun 30 2025 | Sep 30 2025 | Dec 31 2025 | Mar 31 2026 | Jun 30 2026 | Sep 30 2026 | Dec 31 2026 |
| Quarter | Q1 FY2018 | Q2 FY2018 | Q3 FY2018 | Q4 FY2018 | Q1 FY2019 | Q2 FY2019 | Q3 FY2019 | Q4 FY2019 | Q1 FY2020 | Q2 FY2020 | Q3 FY2020 | Q4 FY2020 | Q1 FY2021 | Q2 FY2021 | Q3 FY2021 | Q4 FY2021 | Q1 FY2022 | Q2 FY2022 | Q3 FY2022 | Q4 FY2022 | Q1 FY2023 | Q2 FY2023 | Q3 FY2023 | Q4 FY2023 | Q1 FY2024 | Q2 FY2024 | Q3 FY2024 | Q4 FY2024 | Q1 FY2025 | Q2 FY2025 | Q3 FY2025 | Q4 FY2025 | Q1 FY2026 | Q2 FY2026 | Q3 FY2026 | Q4 FY2026 |

IA. Input Table - Init at Term - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP Capital | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AP O&M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (% MFTA Fare Revenue) ⁽¹⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MFTA Fare Revenue) ⁽²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (\$ per Transaction Unit) ⁽³⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (\$ per Transaction Unit) ⁽⁴⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Unplanned System Expansion - AP O&M ⁽⁵⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Unplanned System Expansion - Capital Payment ⁽⁶⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Unplanned System Expansion Scenario | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

IB. Input Table - Renewal Term 1 - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP O&M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (% MFTA Fare Revenue) ⁽¹⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MFTA Fare Revenue) ⁽²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

IC. Input Table - Renewal Term 2 - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP O&M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (% MFTA Fare Revenue) ⁽¹⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MFTA Fare Revenue) ⁽²⁾ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

2A. Transition Factors and Ramp-up - Init at Term - DO NOT COMPLETE - For calculation purposes only

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| APC factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| APO factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| MFTA Revenue & Transactions ramp-up (Ramp-up) ⁽⁷⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Unplanned System Expansion - AP O&M ⁽⁸⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Unplanned System Expansion - Capital Payment ⁽⁹⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

2B. Transition Factors and Ramp-up - Renewal Term 1 - DO NOT COMPLETE - For calculation purposes only

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| APC factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| APO factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| MFTA Revenue & Transactions ramp-up (Ramp-up) ⁽⁷⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Unplanned System Expansion - AP O&M ⁽⁸⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Unplanned System Expansion - Capital Payment ⁽⁹⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

2C. Transition Factors and Ramp-up - Renewal Term 2 - DO NOT COMPLETE - For calculation purposes only

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| APC factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| APO factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| MFTA Revenue & Transactions ramp-up (Ramp-up) ⁽⁷⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Unplanned System Expansion - AP O&M ⁽⁸⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Unplanned System Expansion - Capital Payment ⁽⁹⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

3. Price Proposal Initial Term - DO NOT ADJUST - Table calculated automatically based on Input and Transition Factors (above)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AP Capital | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AP O&M | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Allowable AP Transaction Rate (% MFTA Fare Revenue) ⁽¹⁾ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other AP Transaction Rate (% MFTA Fare Revenue) ⁽²⁾ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Allowable AP Transaction Rate (\$ per Transaction Unit) ⁽³⁾ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other AP Transaction Rate (\$ per Transaction Unit) ⁽⁴⁾ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Unplanned System Expansion - AP O&M ⁽⁵⁾ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Unplanned System Expansion - Capital Payment ⁽⁶⁾ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total Unplanned System Expansion Scenario | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

4. Price Proposal Renewal Term - DO NOT FILE - Table calculated automatically based on Input and Transition Factors (above)

Pre-Forma Table 5 - Price Proposal Form (Nominal \$)

1. Input Table - PLEASE COMPLETE

| Term | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial | Initial |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Quarter Starting | Jun 01 2024 | Apr 01 2024 | Jul 01 2024 | Oct 01 2024 | Jan 01 2025 | Apr 01 2025 | Jul 01 2025 | Oct 01 2025 | Jan 01 2026 | Apr 01 2026 | Jul 01 2026 | Oct 01 2026 | Jan 01 2027 | Apr 01 2027 | Jul 01 2027 | Oct 01 2027 | Jan 01 2028 | Apr 01 2028 | Jul 01 2028 | Oct 01 2028 | Jan 01 2029 | Apr 01 2029 | Jul 01 2029 | Oct 01 2029 | Jan 01 2030 | Apr 01 2030 | Jul 01 2030 | Oct 01 2030 |
| Quarter Ending | May 31 2024 | Mar 30 2024 | Jun 30 2024 | Dec 31 2024 | Mar 31 2025 | Jun 30 2025 | Sep 30 2025 | Dec 31 2025 | Mar 31 2026 | Jun 30 2026 | Sep 30 2026 | Dec 31 2026 | Mar 31 2027 | Jun 30 2027 | Sep 30 2027 | Dec 31 2027 | Mar 31 2028 | Jun 30 2028 | Sep 30 2028 | Dec 31 2028 | Mar 31 2029 | Jun 30 2029 | Sep 30 2029 | Dec 31 2029 | Mar 31 2030 | Jun 30 2030 | Sep 30 2030 | Dec 31 2030 |
| IA. Input Table - Init at Term - PLEASE COMPLETE | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AP Capital | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AP O&M | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (\$ per Transaction Unit) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (\$ per Transaction Unit) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Unplanned System Expansion - AP O&M | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Unplanned System Expansion - Capital Payment | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

IB. Input Table - Renewal Term 1 - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP O&M | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (\$ per Transaction Unit) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

IC. Input Table - Renewal Term 2 - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP O&M | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (\$ per Transaction Unit) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

2A. Transition Factors and Ramp-up - Init at Term - DO NOT COM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| APC Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| EPO Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| MBTA Revenue & Transactions ramp-up (Ramp-up) ⁽¹⁾ | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Unplanned System Expansion - AP O&M | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Unplanned System Expansion - Capital Payment | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

2B. Transition Factors and Ramp-up - Renewal Term 1 - DO NOT C

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| APC Factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| EPO Factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| MBTA Revenue & Transactions ramp-up (Ramp-up) ⁽¹⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

2C. Transition Factors and Ramp-up - Renewal Term 2 - DO NOT C

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| APC Factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| EPO Factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| MBTA Revenue & Transactions ramp-up (Ramp-up) ⁽¹⁾ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

3. Pr or Proposal Initial Term - DO NOT ADJUST - Table calculated

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AP Capital | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AP O&M | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Allowable AP Transaction Rate (% MBTA Fare Revenue) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other AP Transaction Rate (% MBTA Fare Revenue) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Allowable AP Transaction Rate (\$ per Transaction Unit) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other AP Transaction Rate (\$ per Transaction Unit) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Unplanned System Expansion - AP O&M | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Unplanned System Expansion - Capital Payment | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Total Unplanned System Expansion Scenario | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

4. Pr or Proposal Renewal Terms - DO NOT FILL - Table calculated

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AP O&M | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other AP Transaction Rate (% MBTA Fare Revenue) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other AP Transaction Rate (\$ per Transaction Unit) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) APC is required to be the same as for each year within the Initial Term Period Completion Date and Full Service Commencement Date occurs at the end of each sub-term (Initial Term Renewal Term 1 and Renewal Term 2) and may increase in real \$ terms from the last full quarter of the Initial Term into account for re-estimation purposes. Re-estimate payments are required to be the same in real \$ terms within each fiscal year.
 (2) Proposers shall not include within APT (or APC or EPO) Eligible Substantiated costs or sub-inflation from fare revenue.
 (3) EAPO to be based on the MBTA provided Unplanned System Expansion in quarter following the date of Financial Closing Deadline.
 (4) Transition Factors based on Appendix 9 Payment Mechanism.
 (5) This adjustment is based on the amount on that number of Transactions.
 (6) For re-estimate purposes Allowable AP Transaction Rates shall only be applied for a six-month period.
 (7) For a six-month period APC, APT and EAPO in the Input Table shall apply on a rolling basis.
 (8) Unplanned System Expansion - Capital Payment to be based on the MBTA Unit Costs and Unit Inflation Costs.

Pre-Forma Table 5 – Price Proposal Form (Nominal \$)

1. Input Table - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | |
|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Term | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 | Renewal 2 |
| Quarter Starting | Oct 01 2036 | Jan 01 2037 | Apr 01 2037 | Jul 01 2037 | Oct 01 2037 | Jan 01 2038 | Apr 01 2038 | Jul 01 2038 | Oct 01 2038 | Jan 01 2039 | Apr 01 2039 | Jul 01 2039 | Oct 01 2039 | Jan 01 2040 | Apr 01 2040 | Jul 01 2040 | Oct 01 2040 | Jan 01 2041 | Apr 01 2041 | Jul 01 2041 |
| Quarter Ending | Dec 31 2036 | Mar 31 2037 | Jun 30 2037 | Sep 30 2037 | Dec 31 2037 | Mar 31 2038 | Jun 30 2038 | Sep 30 2038 | Dec 31 2038 | Mar 31 2039 | Jun 30 2039 | Sep 30 2039 | Dec 31 2039 | Mar 31 2040 | Jun 30 2040 | Sep 30 2040 | Dec 31 2040 | Mar 31 2041 | Jun 30 2041 | Sep 30 2041 |
| Quarter | Q4 FY2036 | Q1 FY2037 | Q2 FY2037 | Q3 FY2037 | Q4 FY2037 | Q1 FY2038 | Q2 FY2038 | Q3 FY2038 | Q4 FY2038 | Q1 FY2039 | Q2 FY2039 | Q3 FY2039 | Q4 FY2039 | Q1 FY2040 | Q2 FY2040 | Q3 FY2040 | Q4 FY2040 | Q1 FY2041 | Q2 FY2041 | Q3 FY2041 |

1A. Input Table - Init at Term - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP Capital | | | | | | | | | | | | | | | | | | | | |
| AP O&M | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (\$ per Transaction Unit) | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (\$ per Transaction Unit) | | | | | | | | | | | | | | | | | | | | |
| Unplanned System Expansion - AP O&M | | | | | | | | | | | | | | | | | | | | |
| Unplanned System Expansion - Capital Payment | | | | | | | | | | | | | | | | | | | | |

1B. Input Table - Renewal Term 1 - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP O&M | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | |

1C. Input Table - Renewal Term 2 - PLEASE COMPLETE

| | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP O&M | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | |

2A. Transition Factors and Ramp-up - Init at Term - DO NOT COM

| | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| APC Factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| APO Factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| MBTA Revenue & Transactions ramp-up (Ramp-up) ¹ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Unplanned System Expansion - AP O&M | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Unplanned System Expansion - Capital Payment | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

2B. Transition Factors and Ramp-up - Renewal Term 1 - DO NOT COM

| | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| APC Factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| APO Factor | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| MBTA Revenue & Transactions ramp-up (Ramp-up) ¹ | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |

2C. Transition Factors and Ramp-up - Renewal Term 2 - DO NOT COM

| | | | | | | | | | | | | | | | | | | | | |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| APC Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 88% |
| APO Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 88% |
| MBTA Revenue & Transactions ramp-up (Ramp-up) ¹ | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 88% |

3. Pr or Proposal Initial Term - DO NOT ADJUST - Table calculated

| | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AP Capital | | | | | | | | | | | | | | | | | | | | |
| AP O&M | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (% MBTA Fare Revenue) | | | | | | | | | | | | | | | | | | | | |
| Allowable AP Transaction Rate (\$ per Transaction Unit) | | | | | | | | | | | | | | | | | | | | |
| Other AP Transaction Rate (\$ per Transaction Unit) | | | | | | | | | | | | | | | | | | | | |
| Unplanned System Expansion - AP O&M | | | | | | | | | | | | | | | | | | | | |
| Unplanned System Expansion - Capital Payment | | | | | | | | | | | | | | | | | | | | |
| Total Unplanned System Expansion Scenario | | | | | | | | | | | | | | | | | | | | |

4. Pr or Proposal Renewal Terms - DO NOT FILL - Table calculated

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AP O&M | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Allowable AP Transaction Rate (% MBTA Fare Revenue) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other AP Transaction Rate (% MBTA Fare Revenue) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) APC is required to be the same value for each year within the Initial Term Period Completion Date and Full Service Commencement Date occurs at the end of the Initial Term. (2) Within each sub-term (for all Renewal Terms 1 and Renewal Term FY2036) may increase in real \$ terms from the last full quarter of the Initial Term into account for the adjustment purposes. (3) Proportionate share of the total cost of the system shall be the same in real \$ terms within each fiscal year. (4) Proportionate share of the total cost of the system shall be the same in real \$ terms within each fiscal year. (5) Proportionate share of the total cost of the system shall be the same in real \$ terms within each fiscal year. (6) This adjustment is based on the assumption that number of Transactions is constant. (7) For the adjustment purposes Allowable AP Transaction Rates shall only be calculated for the full month costs on only. (8) For the adjustment of double APC, APO, API and EAPO in the Input Table the full month costs on only. (9) Unplanned System Expansion - Capital Payment to be based on the MB Unit Costs and Unit Initial Installation Costs

Pro-Forma Table 5A – Transaction Channel Pricing - Allowable AP Transaction Rate (% MBTA Fare Revenue) for the relevant Transaction Channel¹

| Transaction Channel ¹ | FY2020 | FY2021 | FY2022 | FY2023 | FY2024 | FY2025 | FY2026 | FY2027 | FY2028 | FY2029 | FY2030 | FY2031 | FY2032 | FY2033 | FY2034 | FY2035 | FY2036 | FY2037 |
|----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Bulk | 203,350,282 | 202,486,540 | 201,275,444 | 199,692,283 | 207,500,947 | 238,833,556 | 254,933,198 | 272,113,942 | 290,448,136 | 310,012,958 | 330,890,732 | 353,169,274 | 376,942,254 | 402,309,591 | 429,377,861 | 4 8,260,746 | 489,079,502 | 525,879,955 |
| PAYG Debit | 14,085,082 | 37,135,157 | 61,885,171 | 88,429,870 | 156,505,422 | 181,090,062 | 194,305,835 | 208,468,879 | 223,646,149 | 239,909,282 | 257,334,917 | 276,005,043 | 296,007,373 | 317,435,732 | 340,390,488 | 364,978,998 | 391,316,094 | 426,453,815 |
| PAYG Credit | 11,646,721 | 30,706,447 | 51,171,823 | 73,121,196 | 129,411,742 | 149,740,374 | 160,668,278 | 172,379,464 | 184,929,298 | 198,377,013 | 212,785,982 | 228,224,001 | 244,763,596 | 262,482,351 | 281,463,259 | 301,795,091 | 323,572,799 | 352,627,599 |
| Card Not Present Debit | 20,546,446 | 24,477,208 | 28,672,619 | 33,146,953 | 45,677,947 | 51,601,919 | 54,049,503 | 56,600,298 | 59,257,571 | 62,024, 88 | 64,904,603 | 67,900,843 | 71,016,492 | 74,254,669 | 77,618,415 | 81,110,660 | 84,734,206 | 85,290,763 |
| Card Not Present Credit | 16,989,516 | 20,239,798 | 23,708,914 | 27,408,667 | 37,770,338 | 42,668,773 | 44,692,639 | 46,801,850 | 48,999,104 | 51,287,105 | 53,668,541 | 56,146,083 | 58,722,361 | 61,399,957 | 64,181,382 | 67,069,062 | 70,065,312 | 70,525,520 |
| FVM - In Station Debit | 98,916,122 | 91,079,420 | 82,520,479 | 73,196,323 | 55,321,124 | 62,601,666 | 65,685,310 | 68,908,622 | 72,276,939 | 75,795,708 | 79,470,491 | 83,306,947 | 87,310,830 | 91,487,973 | 95,844,280 | 100,385,707 | 105,118,246 | 108,613,454 |
| FVM - In Station Credit | 81,792,104 | 75,312,065 | 68,234,818 | 60,524,827 | 45,744,122 | 51,764,281 | 54,314,095 | 56,979,399 | 59,764,604 | 62,674,216 | 65,712,833 | 68,885,135 | 72,195,880 | 75,649,890 | 79,252,048 | 83,007,279 | 86,920,537 | 88,1 6,900 |
| FVM - In Station Cash | 100,111.8 6 | 98,989,881 | 97,644,922 | 96,061,906 | 97,870,094 | 110,946,988 | 116,623,909 | 122,575.1 6 | 128,812,726 | 135,349,031 | 142,196,912 | 149,369,637 | 156,880,909 | 164,744,861 | 172,976,063 | 181,589,517 | 190,600,653 | 194,770,354 |
| FVM - Out of Station Debit | 20,723,524 | 18,141,033 | 15,399,570 | 12,516,807 | 6,902,452 | 7,941,287 | 8,472,720 | 9,039,334 | 9,643,426 | 10,287,438 | 10,973,968 | 11,705,780 | 12,485,811 | 13,317,185 | 14,203,224 | 15,147,457 | 16,153,633 | 17,324,686 |
| FVM - Out of Station Credit | 17,135,939 | 15,000,520 | 12,733,649 | 10,349,940 | 5,707,523 | 6,566,519 | 7,005,952 | 7,474,476 | 7,973,989 | 8,506,512 | 9,074,193 | 9,679,315 | 10,324,310 | 11,011,760 | 11,744,411 | 12,525,181 | 13,357,172 | 14,325,496 |
| FVM - Out of Station Cash | 20,974,038 | 19,716,624 | 18,222,020 | 16,426,895 | 12,211,313 | 14,074,096 | 15,043,268 | 16,079,233 | 17,186,616 | 18,370,364 | 19,635,772 | 20,988,503 | 22,434,621 | 23,980,615 | 25,633,431 | 27,400,508 | 29,289,806 | 31,650,182 |
| Retail Reload Location | 31,679,578 | 28,462,095 | 24,960,514 | 21,158,115 | 13,365,309 | 15,390,254 | 16,434,890 | 17,550,100 | 18,740,632 | 20,011,554 | 21,368,271 | 22,816,553 | 24,362,553 | 26,012,840 | 27,774,420 | 29,654,770 | 31,661,867 | 34,084,812 |
| Sum of MBTA Fare Revenue | 637,981,208 | 661,746,788 | 686,429,943 | 712,033,782 | 813,988,333 | 933,219,775 | 992,259,597 | 1,084,970,753 | 1,121,679,190 | 1,192,605, 69 | 1,268,017,215 | 1,348,197,114 | 1,433,446,990 | 1,524,087,424 | 1,620,459,282 | 1,722,924,976 | 1,8 1,869,827 | 1,947,703,536 |

Allowable AP Transaction Rate²

| Transaction Channel ¹ | Allowable AP Transaction Rate (% MBTA Fare Revenue) | FY2020 | | | | FY2021 | | | | FY2022 | | | | FY2023 | | | | FY2024 | | | | FY2025 | | | |
|---|---|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|----|----|--------|----|--|--|
| | | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | | |
| Bulk | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| PAYG Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| PAYG Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Card Not Present Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Card Not Present Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| FVM - In Station Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| FVM - In Station Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| FVM - In Station Cash | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| FVM - Out of Station Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| FVM - Out of Station Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| FVM - Out of Station Cash | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Retail Reload Location | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Sum of Allowable AP Transaction Rate | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |

(1) See definition within Table 7 of Appendix 8

(2) Allowable AP Transaction Rate related to MBTA Fare Revenue are not subject to inflation.

(3) Allowable AP Transaction Rate is not to include Eligible Subtractions from Fare Revenue as defined in the Project Agreement.

Pro-Forma Table 5A – Transaction Channel P1

| MBTA Fare Revenue | | | | |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|
| Transaction Channel ¹ | FY2028 | FY2029 | FY2040 | FY2041 |
| Bulk | 559,132,659 | 94,488,015 | 620,506,532 | 636,019,195 |
| PAYG Debit | 453,419,556 | 482,090,408 | 503,189,702 | 515,769,445 |
| PAYG Credit | 374,925,124 | 398,632,577 | 416,079,234 | 426,481,214 |
| Card Not Present Debit | 90,683,911 | 96,418,082 | 100,637,940 | 103,153,889 |
| Card Not Present Credit | 74,985,025 | 79,726,515 | 83,215,847 | 85,596,343 |
| FVM - In Station Debit | 113,354,889 | 120,522,602 | 125,797,426 | 128,942,361 |
| FVM - In Station Credit | 93,731,281 | 99,638,144 | 104,019,808 | 106,620,304 |
| FVM - In Station Cash | 207,086,170 | 220,180,746 | 229,817,234 | 235,626,665 |
| FVM - Out of Station Debit | 18,420,169 | 19,584,923 | 20,442,082 | 20,953,134 |
| FVM - Out of Station Credit | 15,231,333 | 16,194,448 | 16,903,219 | 17,325,799 |
| FVM - Out of Station Cash | 33,651,503 | 35,779,371 | 37,345,301 | 38,278,933 |
| Retail Reload Location | 36,240,080 | 38,531,631 | 40,218,016 | 41,223,466 |
| Sum of MBTA Fare Revenue | 2,070,861,700 | 2,201,807,462 | 2,298,172,341 | 2,355,026,648 |

Allowable AP Transaction Rate²

| Transaction Channel ¹ | FY2025 | | FY2026 | | FY2027 | | FY2028 | | FY2029 | | FY2030 | | FY2031 | | FY2032 | | FY2033 | | FY2034 | | FY2035 | | FY2036 | | FY2037 | | FY2038 | | FY2039 | | FY2040 | | FY2041 | | | | | |
|---|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---|---|---|---|
| | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | Quarter | | | | | |
| | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | | | | |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | | |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Allowable AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 7 of Appendix 8
 (2) Allowable AP Transaction Rate related to MB
 (3) Allowable AP Transaction Rate is not to incluc

Pro-Forma Table 5A – Transaction Channel P1

MBTA Fare Revenue

| Transaction Channel ¹ |
|----------------------------------|
| Bulk |
| PAYG Debit |
| PAYG Credit |
| Card Not Present Debit |
| Card Not Present Credit |
| FVM - In Station Debit |
| FVM - In Station Credit |
| FVM - In Station Cash |
| FVM - Out of Station Debit |
| FVM - Out of Station Credit |
| FVM - Out of Station Cash |
| Retail Reload Location |
| Sum of MBTA Fare Revenue |

Allowable AP Transaction Rate²

| Transaction Channel ¹ | FY2030 | | | FY2031 | | | FY2032 | | | FY2033 | | | FY2034 | | | FY2035 | | | FY2036 | | | | | |
|---|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|----|----|----|
| Quarter | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Allowable AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 7 of Appendix 8
 (2) Allowable AP Transaction Rate related to MB
 (3) Allowable AP Transaction Rate is not to includ

Pro-Forma Table 5A – Transaction Channel P1

MBTA Fare Revenue

| Transaction Channel ¹ |
|----------------------------------|
| Bulk |
| PAYG Debit |
| PAYG Credit |
| Card Not Present Debit |
| Card Not Present Credit |
| FVM - In Station Debit |
| FVM - In Station Credit |
| FVM - In Station Cash |
| FVM - Out of Station Debit |
| FVM - Out of Station Credit |
| FVM - Out of Station Cash |
| Retail Reload Location |
| Sum of MBTA Fare Revenue |

Allowable AP Transaction Rate²

| Transaction Channel ¹ | FY2036 | | | FY2037 | | | FY2038 | | | FY2039 | | | FY2040 | | | FY2041 | | | FY2042 | | |
|---|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|---|
| Quarter | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Allowable AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 7 of Appendix 8
 (2) Allowable AP Transaction Rate related to MB
 (3) Allowable AP Transaction Rate is not to includ

Pro-Forma Table 5A – Transaction Channel Pricing - Other AP Transaction Rate (% MBTA Fare Revenue) for the relevant Transaction Channel

| MBTA Fare Revenue | | | | | | | | | | | | | | | | | | |
|----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Transaction Channel ¹ | FY2020 | FY2021 | FY2022 | FY2023 | FY2024 | FY2025 | FY2026 | FY2027 | FY2028 | FY2029 | FY2030 | FY2031 | FY2032 | FY2033 | FY2034 | FY2035 | FY2036 | FY2037 |
| Bulk | 203,350,282 | 202,486,540 | 201,275,444 | 199,692,283 | 207,500,947 | 238,833,556 | 254,933,198 | 272,113,942 | 290,444,136 | 310,012,958 | 330,890,732 | 353,169,274 | 376,942,254 | 402,309,591 | 429,377,861 | 4 8,260,746 | 489,079,502 | 525,879,955 |
| PAYG Debit | 14,085,082 | 37,135,157 | 61,885,171 | 88,429,870 | 156,905,422 | 181,090,062 | 194,305,835 | 208,468,879 | 223,646,149 | 239,909,282 | 257,334,917 | 276,005,043 | 296,007,373 | 317,435,732 | 340,390,488 | 364,978,998 | 391,316,094 | 426,453,815 |
| PAYG Credit | 11,646,721 | 30,706,447 | 51,171,823 | 73,121,196 | 129,411,742 | 149,740,374 | 160,668,278 | 172,379,464 | 184,929,298 | 198,377,013 | 212,785,982 | 228,224,001 | 244,763,596 | 262,482,351 | 281,463,259 | 301,795,091 | 323,572,799 | 352,627,599 |
| Card Not Present Debit | 20,546,446 | 24,477,208 | 28,672,619 | 33,146,953 | 45,677,947 | 51,601,919 | 54,049,503 | 56,600,298 | 59,257,571 | 62,024, 88 | 64,904,603 | 67,900,843 | 71,016,492 | 74,254,669 | 77,618,415 | 81,110,660 | 84,734,206 | 85,290,763 |
| Card Not Present Credit | 16,989,516 | 20,239,798 | 23,708,914 | 27,408,667 | 37,770,338 | 42,668,773 | 44,692,639 | 46,801,850 | 48,999,104 | 51,287,105 | 53,665,541 | 56,146,083 | 58,722,361 | 61,399,957 | 64,181,382 | 67,069,062 | 70,065,312 | 70,525,520 |
| FVM - In Station Debit | 98,916,122 | 91,079,420 | 82,520,479 | 73,196,323 | 55,321,124 | 62,601,666 | 65,685,310 | 68,908,622 | 72,276,939 | 75,795,708 | 79,470,491 | 83,306,947 | 87,310,830 | 91,487,973 | 95,844,280 | 100,385,707 | 105,118,246 | 106,613,454 |
| FVM - In Station Credit | 81,792,104 | 75,312,065 | 68,234,818 | 60,524,827 | 45,744,122 | 51,764,281 | 54,314,095 | 56,979,399 | 59,764,604 | 62,674,216 | 65,712,833 | 68,885,135 | 72,195,880 | 75,649,890 | 79,252,048 | 83,007,279 | 86,920,537 | 88,1 6,900 |
| FVM - In Station Cash | 100,111.8 6 | 98,989,881 | 97,644,922 | 96,061,906 | 97,870,094 | 110,946,988 | 116,623,909 | 122,575,1 6 | 128,812,726 | 135,349,031 | 142,196,912 | 149,369,637 | 156,880,909 | 164,744,861 | 172,976,063 | 181,589,517 | 190,600,653 | 194,770,354 |
| FVM - Out of Station Debit | 20,723,524 | 18,141,033 | 15,399,570 | 12,516,807 | 6,902,452 | 7,941,287 | 8,472,720 | 9,039,334 | 9,643,426 | 10,287,438 | 10,973,968 | 11,705,780 | 12,485,811 | 13,317,185 | 14,203,224 | 15,147,457 | 16,153,633 | 17,324,686 |
| FVM - Out of Station Credit | 17,135,939 | 15,000,520 | 12,733,649 | 10,349,940 | 5,707,523 | 6,566,519 | 7,005,982 | 7,474,476 | 7,973,989 | 8,506,512 | 9,074,193 | 9,679,315 | 10,324,310 | 11,011,760 | 11,744,411 | 12,525,181 | 13,357,172 | 14,325,496 |
| FVM - Out of Station Cash | 20,974,038 | 19,716,624 | 18,222,020 | 16,426,895 | 12,211,313 | 14,074,096 | 15,043,268 | 16,079,233 | 17,186,616 | 18,370,364 | 19,635,772 | 20,988,503 | 22,434,621 | 23,980,615 | 25,633,431 | 27,400,508 | 29,289,806 | 31,650,182 |
| Retail Reload Location | 31,679,578 | 28,462,095 | 24,960,514 | 21,158,115 | 13,365,309 | 15,390,254 | 16,434,890 | 17,550,100 | 18,740,632 | 20,011,554 | 21,368,271 | 22,816,553 | 24,362,553 | 26,012,840 | 27,774,420 | 29,654,770 | 31,661,867 | 34,084,812 |
| Sum of MBTA Fare Revenue | 637,951,208 | 661,746,788 | 686,429,943 | 712,033,782 | 813,988,333 | 933,219,775 | 992,229,597 | 1,054,970,753 | 1,121,679,190 | 1,192,605,769 | 1,268,017,215 | 1,348,197,114 | 1,433,446,990 | 1,524,087,424 | 1,620,459,282 | 1,722,924,976 | 1,831,869,827 | 1,947,703,536 |

Other AP Transaction Rate²

| Transaction Channel ¹ | Other AP Transaction Rate (% MBTA Fare Revenue) ³ | Quarter | | | | | | | | | | | | | | | | | |
|---|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | FY2020 Q4 | FY2021 Q1 | FY2021 Q2 | FY2021 Q3 | FY2021 Q4 | FY2022 Q1 | FY2022 Q2 | FY2022 Q3 | FY2022 Q4 | FY2023 Q1 | FY2023 Q2 | FY2023 Q3 | FY2023 Q4 | FY2024 Q1 | FY2024 Q2 | FY2024 Q3 | FY2024 Q4 | FY2025 Q1 |
| Bulk ² | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Other AP Transaction Rate | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 7 of Appendix 8

(2) Other AP Transaction Rate related to MBTA Fare Revenue are not subject to inflation.

(3) Other AP Transaction Rate is not to include Eligible Subtractions from Fare Revenue as defined in the Project Agreement.

Pro-Forma Table 5A – Transaction Channel Pr

| MBTA Fare Revenue | | | | |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|
| Transaction Channel ¹ | FY 2028 | FY 2029 | FY 2030 | FY 2031 |
| Bulk | 559,132,659 | 94,488,015 | 620,506,532 | 636,019,195 |
| PAYG Debit | 453,419,556 | 482,090,408 | 503,189,702 | 515,769,445 |
| PAYG Credit | 374,925,124 | 398,632,577 | 416,079,234 | 426,481,214 |
| Card Not Present Debit | 90,683,911 | 96,418,082 | 100,637,940 | 103,153,889 |
| Card Not Present Credit | 74,985,025 | 79,726,515 | 83,215,847 | 85,596,243 |
| FVM - In Station Debit | 113,354,889 | 120,522,602 | 125,797,426 | 128,942,361 |
| FVM - In Station Credit | 93,731,281 | 99,681,144 | 104,019,808 | 106,620,304 |
| FVM - In Station Cash | 207,086,170 | 220,180,746 | 229,817,234 | 235,624,665 |
| FVM - Out of Station Debit | 18,420,169 | 19,584,923 | 20,442,082 | 20,953,134 |
| FVM - Out of Station Credit | 15,231,333 | 16,194,448 | 16,903,219 | 17,325,799 |
| FVM - Out of Station Cash | 33,651,503 | 35,779,371 | 37,345,301 | 38,278,933 |
| Retail Reload Location | 36,240,080 | 38,531,631 | 40,218,016 | 41,223,466 |
| Sum of MBTA Fare Revenue | 2,070,861,700 | 2,201,807,462 | 2,298,172,341 | 2,355,626,648 |

Other AP Transaction Rate²

| Transaction Channel ¹ | FY 2025 | | | FY 2026 | | | FY 2027 | | | FY 2028 | | | FY 2029 | | | FY 2030 | | | FY 2031 | | | | |
|---|---------|----|----|---------|----|----|---------|----|----|---------|----|----|---------|----|----|---------|----|----|---------|----|----|----|---|
| | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | |
| Bulk ² | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Other AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 7 of Appendix 8
 (2) Other AP Transaction Rate related to MBTAF
 (3) Other AP Transaction Rate is not to include EI

Pro-Forma Table 5A – Transaction Channel Pr

MBTA Fare Revenue

| Transaction Channel ¹ |
|----------------------------------|
| Bulk |
| PAYG Debit |
| PAYG Credit |
| Card Not Present Debit |
| Card Not Present Credit |
| FVM - In Station Debit |
| FVM - In Station Credit |
| FVM - In Station Cash |
| FVM - Out of Station Debit |
| FVM - Out of Station Credit |
| FVM - Out of Station Cash |
| Retail Reload Location |
| Sum of MBTA Fare Revenue |

Other AP Transaction Rate²

| Transaction Channel ¹ | FY2030 | | | FY2031 | | | FY2032 | | | FY2033 | | | FY2034 | | | FY2035 | | | FY2036 | | | | | |
|---|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|----|----|----|
| Quarter | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| Bulk ³ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Other AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 7 of Appendix 8
 (2) Other AP Transaction Rate related to MBTAF
 (3) Other AP Transaction Rate is not to include EI

Pro-Forma Table 5A – Transaction Channel Pr

| MBTA Fare Revenue | |
|----------------------------------|--|
| Transaction Channel ¹ | |
| Bulk | |
| PAYG Debit | |
| PAYG Credit | |
| Card Not Present Debit | |
| Card Not Present Credit | |
| FVM - In Station Debit | |
| FVM - In Station Credit | |
| FVM - In Station Cash | |
| FVM - Out of Station Debit | |
| FVM - Out of Station Credit | |
| FVM - Out of Station Cash | |
| Retail Reload Location | |
| Sum of MBTA Fare Revenue | |

Other AP Transaction Rate²

| Transaction Channel ¹ | FY2036 | | FY2037 | | FY2038 | | FY2039 | | FY2040 | | FY2041 | | FY2042 | | FY2043 | | FY2044 | | FY2045 | | |
|---|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|---|
| | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | |
| Bulk ³ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Other AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 7 of Appendix 8
 (2) Other AP Transaction Rate related to MBTAF
 (3) Other AP Transaction Rate is not to include EI

Pro-Forma Table 5Bii – Transaction Channel Pricing - Allowable AP Transaction Rate (\$/Transaction Unit) for the relevant Transaction Channel

| MBTA Transaction Units | | | | | | | | | | | | | | | | | | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Transaction Channel ¹ | FY2020 | FY2021 | FY2022 | FY2023 | FY2024 | FY2025 | FY2026 | FY2027 | FY2028 | FY2029 | FY2030 | FY2031 | FY2032 | FY2033 | FY2034 | FY2035 | FY2036 | FY2037 |
| Bulk | 24,374 | 23,678 | 22,962 | 22,226 | 22,532 | 25,302 | 26,349 | 27,438 | 28,573 | 29,754 | 30,983 | 32,262 | 33,594 | 34,980 | 36,423 | 37,925 | 39,489 | 41,124 |
| PAYG Debit | 2,319,120 | 5,965,203 | 9,698,458 | 13,520,453 | 23,345,209 | 26,353,550 | 27,587,128 | 28,876,065 | 30,222,775 | 31,629,775 | 33,099,688 | 34,635,251 | 36,239,315 | 37,914,855 | 39,664,970 | 41,492,894 | 43,401,996 | 46,145,582 |
| PAYG Credit | 1,917,642 | 4,932,528 | 8,019,495 | 11,179,838 | 19,303,767 | 21,791,314 | 22,811,339 | 23,877,140 | 24,990,712 | 26,154,137 | 27,369,84 | 28,639,315 | 29,965,689 | 31,351,166 | 32,798,307 | 34,309,787 | 35,888,392 | 38,157,018 |
| Card Not Present Debit | 1,223,075 | 1,421,525 | 1,624,561 | 1,832,266 | 2,463,338 | 2,714,957 | 2,774,374 | 2,834,445 | 2,895,139 | 2,956,416 | 3,018,237 | 3,080,556 | 3,143,325 | 3,206,490 | 3,269,995 | 3,333,776 | 3,397,765 | 3,336,666 |
| Card Not Present Credit | 1,011,341 | 1,175,435 | 1,343,323 | 1,515,070 | 2,036,910 | 2,244,953 | 2,294,084 | 2,343,766 | 2,393,942 | 2,444,611 | 2,495,730 | 2,547,261 | 2,599,163 | 2,651,394 | 2,703,905 | 2,756,644 | 2,809,556 | 2,793,034 |
| FVM - In Station Debit | 4,646,229 | 4,173,783 | 3,689,330 | 3,192,649 | 2,354,122 | 2,598,963 | 2,660,471 | 2,722,952 | 2,786,393 | 2,850,778 | 2,916,089 | 2,982,306 | 3,049,406 | 3,117,362 | 3,186,145 | 3,255,723 | 3,326,058 | 3,291,090 |
| FVM - In Station Credit | 3,841,890 | 3,451,232 | 3,050,646 | 2,639,949 | 1,946,585 | 2,149,039 | 2,199,900 | 2,251,564 | 2,304,022 | 2,357,261 | 2,411,266 | 2,466,019 | 2,521,503 | 2,577,695 | 2,634,571 | 2,692,103 | 2,750,262 | 2,721,348 |
| FVM - In Station Cash | 14,257,601 | 13,753,964 | 13,236,187 | 12,704,002 | 12,627,445 | 13,965,521 | 14,322,055 | 14,685,757 | 15,056,665 | 15,434,811 | 15,820,218 | 16,212,902 | 16,612,870 | 17,020,118 | 17,434,634 | 17,856,393 | 18,285,359 | 18,229,640 |
| FVM - Out of Station Debit | 973,413 | 831,327 | 688,485 | 545,953 | 293,725 | 329,689 | 343,173 | 357,193 | 371,770 | 386,924 | 402,679 | 419,055 | 436,078 | 453,770 | 472,157 | 491,264 | 511,119 | 534,802 |
| FVM - Out of Station Credit | 804,899 | 687,410 | 569,297 | 451,440 | 242,877 | 272,615 | 283,764 | 295,357 | 307,410 | 319,941 | 332,968 | 346,510 | 360,85 | 375,215 | 390,419 | 406,218 | 422,636 | 442,219 |
| FVM - Out of Station Cash | 2,987,053 | 2,739,490 | 2,470,073 | 2,172,425 | 1,575,534 | 1,771,586 | 1,847,396 | 1,926,457 | 2,008,910 | 2,094,903 | 2,184,92 | 2,278,137 | 2,375,709 | 2,477,485 | 2,583,649 | 2,694,397 | 2,809,931 | 2,962,316 |
| Retail Reload Location | 3,550,850 | 3,112,404 | 2,662,924 | 2,202,208 | 1,357,177 | 1,524,682 | 1,588,461 | 1,654,876 | 1,724,036 | 1,796,052 | 1,871,043 | 1,949,128 | 2,030,436 | 2,115,098 | 2,203,250 | 2,295,036 | 2,390,604 | 2,510,777 |
| Standard Fare Card Enablements ² | 639,154 | 1,085,719 | 875,268 | 840,258 | 806,647 | 774,381 | 743,406 | 713,670 | 685,123 | 657,718 | 631,409 | 609,246 | 590,968 | 573,239 | 556,042 | 539,361 | 525,836 | 515,319 |
| Sum of MBTA Transaction Units | 38,196,641 | 43,353,698 | 47,951,609 | 52,818,737 | 68,375,888 | 76,516,552 | 79,481,900 | 82,566,670 | 85,775,470 | 89,113,081 | 92,584,486 | 96,197,948 | 99,958,641 | 103,868,867 | 107,934,467 | 112,161,521 | 116,559,003 | 121,647,235 |
| Inflation Index³ | 1.0506 | 1.0769 | 1.1038 | 1.1314 | 1.1597 | 1.1887 | 1.2184 | 1.2489 | 1.2801 | 1.3121 | 1.3449 | 1.3785 | 1.4130 | 1.4483 | 1.4845 | 1.5216 | 1.5597 | 1.5987 |

| Allowable AP Transaction Rate | | | | | | | | | | | | | | | | | | | |
|---|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Transaction Channel ¹ | Other AP Transaction Rate (\$ per Transaction on Unit) ⁴ | FY2020 | FY2021 | FY2021 | FY2021 | FY2021 | FY2022 | FY2022 | FY2022 | FY2022 | FY2023 | FY2023 | FY2023 | FY2023 | FY2024 | FY2024 | FY2024 | FY2024 | FY2025 |
| | | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 |
| Bulk | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Standard Fare Card Enablements ² | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Allowable AP Transaction Rate | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 8 of Appendix 8
 (2) For evaluation purposes only, all Proposers are to assume that all Fare Cards are Long-Term Fare Cards, regardless of the particular solution proposed. Proposers should refer to the Payment Mechanism for how Limited Term Fare Cards will be treated as part of the APT during the Term
 (3) Allowable AP Transaction Rate related to Transaction Units are subject to inflation in accordance with the Agreement at the Inflation Index (CPI-U) which Proposers should assume is 2.5% per annum and inflation is applied each July 1 based on the inflation factor from the prior December (i.e., the inflation factor in FY2018 is 1.00, in FY2019 it is 1.025 etc
 (4) Allowable AP Transaction Rate is not to include Eligible Subtractions from Fare Revenue as defined in the Project Agreement.

Pro-Forma Table 5Bii - Transaction Channel I

| Transaction Channel ¹ | FY2018 | FY2019 | FY2040 | FY2041 |
|---|--------------------|--------------------|--------------------|--------------------|
| Bulk | 42,969 | 44,572 | 45,388 | 45,388 |
| PAYG Debit | 47,866,812 | 49,652,244 | 50,613,305 | 50,613,305 |
| PAYG Credit | 39,580,275 | 41,066,619 | 41,808,306 | 41,808,306 |
| Card Not Present Debit | 3,461,124 | 3,590,223 | 3,655,955 | 3,655,955 |
| Card Not Present Credit | 2,861,946 | 2,968,696 | 3,023,049 | 3,023,049 |
| FVM - In Station Debit | 3,413,848 | 3,541,185 | 3,606,019 | 3,606,019 |
| FVM - In Station Credit | 2,822,854 | 2,928,147 | 2,981,757 | 2,981,757 |
| FVM - In Station Cash | 18,909,605 | 19,614,934 | 19,974,055 | 19,974,055 |
| FVM - Out of Station Debit | 554,750 | 575,442 | 585,978 | 585,978 |
| FVM - Out of Station Credit | 4,874 | 475,824 | 484,536 | 484,536 |
| FVM - Out of Station Cash | 3,072,811 | 3,187,427 | 3,245,784 | 3,245,784 |
| Retail Reload Location | 2,604,429 | 2,701,574 | 2,751,036 | 2,751,036 |
| Standard Fare Card Enablements ² | 505,013 | 494,912 | 489,913 | 480,115 |
| Sum of MBTA Transaction Units | 126,155,150 | 130,831,799 | 133,213,081 | 133,203,283 |

| Inflation Index ³ | 1.6386 | 1.6796 | 1.7216 | 1.7646 |
|------------------------------|--------|--------|--------|--------|
|------------------------------|--------|--------|--------|--------|

Allowable AP Transaction Rate

| Transaction Channel ¹ | FY2025 | | | FY2026 | | | FY2027 | | | FY2028 | | | FY2029 | | | FY2030 | | | FY2031 | | | |
|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Quarter | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Standard Fare Card Enablements ² | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Allowable AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 8 of Appendix 8

(2) For evaluation purposes only, all Proposers are

(3) Allowed AP Transaction Rate is not to include

(4) Allowed AP Transaction Rate is not to include

Pro-Forma Table 5Bii – Transaction Channel I

MBTA Transaction Units

| Transaction Channel ¹ |
|---|
| Bulk |
| PAYG Debit |
| PAYG Credit |
| Card Not Present Debit |
| Card Not Present Credit |
| FVM - In Station Debit |
| FVM - In Station Credit |
| FVM - In Station Cash |
| FVM - Out of Station Debit |
| FVM - Out of Station Credit |
| FVM - Out of Station Cash |
| Retail Reload Location |
| Standard Fare Card Enablements ² |
| Sum of MBTA Transaction Units |

Inflation Index³

Allowable AP Transaction Rate

| Transaction Channel ¹ | FY2030 | FY2031 | FY2031 | FY2031 | FY2031 | FY2032 | FY2032 | FY2032 | FY2032 | FY2033 | FY2033 | FY2033 | FY2033 | FY2034 | FY2034 | FY2034 | FY2034 | FY2035 | FY2035 | FY2035 | FY2035 | FY2036 | FY2036 | FY2036 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Quarter | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Standard Fare Card Enablements ² | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Allowable AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 8 of Appendix 8
 (2) For evaluation purposes only, all Proposers are
 (3) Allowable AP Transaction Rate related to Tar
 (4) Allowable AP Transaction Rate is not to indu

Pro-Forma Table 5Bii – Transaction Channel I

MBTA Transaction Units

| Transaction Channel ¹ |
|---|
| Bulk |
| PAYG Debit |
| PAYG Credit |
| Card Not Present Debit |
| Card Not Present Credit |
| FVM - In Station Debit |
| FVM - In Station Credit |
| FVM - In Station Cash |
| FVM - Out of Station Debit |
| FVM - Out of Station Credit |
| FVM - Out of Station Cash |
| Retail Reload Location |
| Standard Fare Card Enablements ² |
| Sum of MBTA Transaction Units |

Inflation Index³

Allowable AP Transaction Rate

| Transaction Channel ¹ | FY2036 | | | FY2037 | | | FY2038 | | | FY2039 | | | FY2040 | | | FY2041 | | | | |
|---|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|--------|----|----|----|----|
| Quarter | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Standard Fare Card Enablements ² | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Allowable AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 8 of Appendix 8
 (2) For evaluation purposes only, all Proposers are
 (3) Allowable AP Transaction Rate related to Tar
 (4) Allowable AP Transaction Rate is not to indu

Pro-Forma Table 5Bii – Transaction Channel Pricing - Other AP Transaction Rate (\$/Transaction Unit) for the relevant Transaction Channel

| MBTA Transaction Units | | | | | | | | | | | | | | | | | | |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|
| Transaction Channel ¹ | FY2020 | FY2021 | FY2022 | FY2023 | FY2024 | FY2025 | FY2026 | FY2027 | FY2028 | FY2029 | FY2030 | FY2031 | FY2032 | FY2033 | FY2034 | FY2035 | FY2036 | FY2037 |
| Bulk | 28,374 | 23,678 | 22,962 | 22,226 | 22,532 | 25,302 | 26,349 | 27,438 | 28,573 | 29,754 | 30,983 | 32,262 | 33,594 | 34,980 | 36,423 | 37,925 | 39,489 | 41,124 |
| PAYG Debit | 2,319,120 | 5,965,203 | 9,698,458 | 13,520,453 | 23,345,209 | 26,353,550 | 27,587,128 | 28,876,065 | 30,222,775 | 31,629,775 | 33,099,688 | 34,635,251 | 36,239,315 | 37,914,855 | 39,664,970 | 41,492,894 | 43,401,996 | 46,145, 82 |
| PAYG Credit | 1,917,642 | 4,932,528 | 8,019,495 | 11,179,838 | 19,303,767 | 21,791,314 | 22,811,339 | 23,877,140 | 24,990,712 | 26,154,137 | 27,369,584 | 28,639,315 | 29,965,689 | 31,351,166 | 32,798,307 | 34,309,787 | 35,888,392 | 38,157,018 |
| Card Not Present Debit | 1,223,075 | 1,421,525 | 1,624,561 | 1,832,266 | 2,466,358 | 2,714,957 | 2,774,374 | 2,834,445 | 2,895,139 | 2,9 6,416 | 3,018,237 | 3,080,5 6 | 3,143,325 | 3,206,490 | 3,269,995 | 3,333,776 | 3,397,765 | 3,336,666 |
| Card Not Present Credit | 1,011,341 | 1,175,435 | 1,343,323 | 1,515,070 | 2,036,910 | 2,244,953 | 2,294,084 | 2,343,756 | 2,393,942 | 2,444,611 | 2,495,730 | 2,547,261 | 2, 99,163 | 2,651,394 | 2,703,905 | 2,756,644 | 2,809,556 | 2,759,034 |
| FVM - In Station Debit | 4,646,229 | 4,173,783 | 3,689,330 | 3,192,649 | 2,354,122 | 2,598,963 | 2,660,471 | 2,722,952 | 2,786,393 | 2,850,778 | 2,916,089 | 2,982,306 | 3,049,406 | 3,117,362 | 3,186,145 | 3,255,723 | 3,326,058 | 3,291,090 |
| FVM - In Station Credit | 3,841,890 | 3,451,232 | 3,050,646 | 2,639,949 | 1,946,585 | 2,149,039 | 2,199,900 | 2,251,564 | 2,304,022 | 2,357,261 | 2,411,266 | 2,466,019 | 2,521,503 | 2,577,695 | 2,634,571 | 2,692,103 | 2,750,262 | 2,721,348 |
| FVM - In Station Cash | 14,257,601 | 13,753,964 | 13,236,187 | 12,704,902 | 12,627,445 | 13,965,521 | 14,322,055 | 14,685,757 | 15,0 6,665 | 15,434,811 | 15,820,218 | 16,212,902 | 16,612,870 | 17,020,118 | 17,434,634 | 17,856,393 | 18,285,359 | 18,229,640 |
| FVM - Out of Station Debit | 973,413 | 831,327 | 688,485 | 545,953 | 293,725 | 329,689 | 343,173 | 357,193 | 371,770 | 386,924 | 402,679 | 419,055 | 436,078 | 453,770 | 472,157 | 491,264 | 511,119 | 534,802 |
| FVM - Out of Station Credit | 804,899 | 687,410 | 569,297 | 451,440 | 242,877 | 272,615 | 283,764 | 295,357 | 307,410 | 319,941 | 332,968 | 346,510 | 360,585 | 375,215 | 390,419 | 406,218 | 422,636 | 442,219 |
| FVM - Out of Station Cash | 2,987,053 | 2,739,490 | 2,470,073 | 2,172,425 | 1,575,534 | 1,771,586 | 1,847,396 | 1,926,457 | 2,008,910 | 2,094,903 | 2,184,592 | 2,278,137 | 2,375,709 | 2,477,485 | 2,583,649 | 2,694,397 | 2,809,931 | 2,962,316 |
| Retail Reload Location | 3,550,850 | 3,112,404 | 2,662,924 | 2,202,208 | 1,357,177 | 1,524,682 | 1,588,461 | 1,654,876 | 1,724,036 | 1,796,052 | 1,871,043 | 1,949,128 | 2,030,436 | 2,115,998 | 2,203,250 | 2,295,036 | 2,390,604 | 2,510,777 |
| Standard Fare Card Enablement ² | 639,154 | 1,085,719 | 875,208 | 840,258 | 806,647 | 774,381 | 743,406 | 713,670 | 685,123 | 657,718 | 631,409 | 609,246 | 60,968 | 573,229 | 556,942 | 539,361 | 525,836 | 515,319 |
| Sum of MBTA Transaction Units | 38,196,641 | 43,553,698 | 47,951,609 | 53,818,737 | 68,3 5,888 | 76,516,553 | 9,481,900 | 82,566,670 | 85,7 5,470 | 89,113,081 | 92,584,486 | 96,197,948 | 99,958,641 | 103,868,867 | 107,934,467 | 112,161,521 | 116,559,003 | 121,647,235 |

| Inflation Index ³ | 1.0506 | 1.0769 | 1.1038 | 1.1314 | 1.1597 | 1.1887 | 1.2184 | 1.2489 | 1.2801 | 1.3121 | 1.3449 | 1.3785 | 1.4130 | 1.4483 | 1.4845 | 1.5216 | 1.5 9, 97 | 1. 987 |
|------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|--------|
|------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|--------|

Other AP Transaction Rate

| Transaction Channel ¹ | Other AP Transaction Rate (\$ per Transaction Unit) ⁴ | | | | | | | | | | | | | | | | | | |
|--|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | FY2020 | FY2021 | FY2021 | FY2021 | FY2021 | FY2022 | FY2022 | FY2022 | FY2022 | FY2023 | FY2023 | FY2023 | FY2023 | FY2024 | FY2024 | FY2024 | FY2024 | FY2025 |
| Quarter | | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 |
| Bulk | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Standard Fare Card Enablement ² | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Other AP Transaction Rate | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 8 of Appendix 8
 (2) For evaluation purposes only, all Proposers are to assume that all Fare Cards are Long-Term Fare Cards, regardless of the particular solution proposed. Proposers should refer to the Payment Mechanism for how Limited Term Fare Cards will be treated as part of the APT during the Term
 (3) Other AP Transaction Rate related to Transactions Units are subject to inflation in accordance with the Agreement at the Inflation Index (CPI-U) which Proposers should assume is 2.5% per annum and inflation is applied each July 1 based on the inflation factor from the prior December (i.e., in FY2019 it is 1.025 etc.)
 (4) Other AP Transaction Rate is not to include Eligible Subtractions from Fare Revenue as defined in the Project Agreement.

Pro-Forma Table 5Bii – Transaction Channel I

| MBTA Transaction Units | | | | |
|---|--------------------|--------------------|--------------------|--------------------|
| Transaction Channel ¹ | FY2028 | FY2029 | FY2040 | FY2041 |
| Bulk | 42,969 | 44,572 | 45,388 | 45,388 |
| PAYG Debit | 47,866,812 | 49,652,244 | 50,61,305 | 50,61,305 |
| PAYG Credit | 39,580,275 | 41,066,619 | 41,808,306 | 41,808,306 |
| Card Not Present Debit | 3,461,124 | 3,590,223 | 3,655,955 | 3,655,955 |
| Card Not Present Credit | 2,861,946 | 2,968,696 | 3,023,049 | 3,023,049 |
| FVM - In Station Debit | 3,413,848 | 3,541,185 | 3,606,019 | 3,606,019 |
| FVM - In Station Credit | 2,822,854 | 2,928,147 | 2,981,757 | 2,981,757 |
| FVM - In Station Cash | 18,909,605 | 19,614,934 | 19,974,055 | 19,974,055 |
| FVM - Out of Station Debit | 554,750 | 575,442 | 585,978 | 585,978 |
| FVM - Out of Station Credit | 4,8714 | 475,824 | 484,536 | 484,536 |
| FVM - Out of Station Cash | 3,072,811 | 3,187,427 | 3,245,784 | 3,245,784 |
| Retail Reload Location | 2,604,429 | 2,701,574 | 2,751,036 | 2,751,036 |
| Standard Fare Card Enablements ² | 505,013 | 404,913 | 489,913 | 480,115 |
| Sum of MBTA Transaction Units | 126,155,150 | 130,817,999 | 133,213,081 | 133,303,283 |

| Inflation Index ³ | 1.6386 | 1.6796 | 1.7216 | 1.7646 |
|------------------------------|--------|--------|--------|--------|
|------------------------------|--------|--------|--------|--------|

Other AP Transaction Rate

| Transaction Channel ¹ | FY2025 | | FY2026 | | FY2027 | | FY2028 | | FY2029 | | FY2030 | | FY2031 | | FY2032 | | FY2033 | | FY2034 | | FY2035 | | FY2036 | | FY2037 | | FY2038 | | FY2039 | | FY2040 | | FY2041 | | |
|---|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | | | | |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Standard Fare Card Enablements ⁴ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Other AP Transaction Rate | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

(1) See definition within Table 8 of Appendix 8
 (2) For evaluation purposes only, all Proposers are
 (3) Other AP Transaction Rate related to Transact
 (4) Other AP Transaction Rate is not to include EI

Pro-Forma Table 5Bii – Transaction Channel I

MBTA Transaction Units

| Transaction Channel ¹ |
|--|
| Bulk |
| PAYG Debit |
| PAYG Credit |
| Card Not Present Debit |
| Card Not Present Credit |
| FVM - In Station Debit |
| FVM - In Station Credit |
| FVM - In Station Cash |
| FVM - Out of Station Debit |
| FVM - Out of Station Credit |
| FVM - Out of Station Cash |
| Retail Reload Location |
| Standard Fare Card Enablement ² |
| Sum of MBTA Transaction Units |

Inflation Index³

Other AP Transaction Rate

| Transaction Channel ¹ | FY2030 | FY2031 | FY2031 | FY2031 | FY2031 | FY2032 | FY2032 | FY2032 | FY2032 | FY2033 | FY2033 | FY2033 | FY2033 | FY2034 | FY2034 | FY2034 | FY2034 | FY2035 | FY2035 | FY2035 | FY2035 | FY2036 | FY2036 | FY2036 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Quarter | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Standard Fare Card Enablement ⁴ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Other AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 8 of Appendix 8
 (2) For evaluation purposes only, all Proposers are
 (3) Other AP Transaction Rate related to Transact
 (4) Other AP Transaction Rate is not to include EI

Pro-Forma Table 5Bii - Transaction Channel I

MBTA Transaction Units

| Transaction Channel ¹ |
|--|
| Bulk |
| PAYG Debit |
| PAYG Credit |
| Card Not Present Debit |
| Card Not Present Credit |
| FVM - In Station Debit |
| FVM - In Station Credit |
| FVM - In Station Cash |
| FVM - Out of Station Debit |
| FVM - Out of Station Credit |
| FVM - Out of Station Cash |
| Retail Reload Location |
| Standard Fare Card Enablers ² |
| Sum of MBTA Transaction Units |

Inflation Index³

Other AP Transaction Rate

| Transaction Channel ¹ | FY2036 | FY2037 | FY2037 | FY2037 | FY2037 | FY2038 | FY2038 | FY2038 | FY2038 | FY2039 | FY2039 | FY2039 | FY2039 | FY2040 | FY2040 | FY2040 | FY2040 | FY2041 | FY2041 | FY2041 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Quarter | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 |
| Bulk | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PAYG Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Card Not Present Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - In Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Debit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Credit | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| FVM - Out of Station Cash | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Retail Reload Location | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Standard Fare Card Enablers ⁴ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Sum of Other AP Transaction Rate | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

(1) See definition within Table 8 of Appendix 8
 (2) For evaluation purposes only, all Proposers are
 (3) Other AP Transaction Rate related to Transact
 (4) Other AP Transaction Rate is not to include EI

Pro-Forma Table 6A – Unplanned System Expansion - Unit Price Form¹

| Item | Expansion Details | Order Size | | | | Unit Installation Cost (SFY2017/Unit) | Expansion AP O&M Per Unit (u) Cost per Year (y) EAPO _y per year ² (SFY2017/Unit) |
|--|--------------------------|--------------------------|---------|-----------|-----|---------------------------------------|--|
| | | Unit Cost (SFY2017/Unit) | | | | | |
| | | A | B | C | D | | |
| Full Functionality Fare Vending Machine | Order Size Band | 1 – 19 | 20 -99 | 100 – 499 | 500 | | |
| | Unit Cost (SFY2017/Unit) | | | | | | |
| Limited Functionality Fare Vending Machine | Order Size | 1 – 19 | 20 – 99 | 100 – 499 | 500 | | |
| | Unit Cost (SFY2017/Unit) | | | | | | |
| Gate | Order Size | 1 – 10 | 11 – 49 | 50 – 199 | 200 | | |
| | Unit Cost (SFY2017/Unit) | | | | | | |
| Accessible Gate | Order Size | 1 – 10 | 11 – 19 | 20 – 99 | 100 | | |
| | Unit Cost (SFY2017/Unit) | | | | | | |
| Vehicle Validator | Order Size | 1 – 9 | 10 – 24 | 25 – 49 | 50 | | |
| | Unit Cost (SFY2017/Unit) | | | | | | |
| Station Validator | Order Size | 1 – 9 | 10 – 24 | 25 – 49 | 50 | | |
| | Unit Cost (SFY2017/Unit) | | | | | | |
| Inspection Device | Order Size | 1 – 4 | 5 – 24 | 25 – 49 | 50 | | |
| | Unit Cost (SFY2017/Unit) | | | | | | |
| Reader | Order Size | 1 – 4 | 5 – 24 | 25 – 49 | 50 | | |
| | Unit Cost (SFY2017/Unit) | | | | | | |

[1] The Unplanned System Expansion Unit Price Form shall be included as a table in Attachment 11-B of Appendix 11 (Unit Rates and Changes in Cost Methodology)

[2] EAPO for Fiscal Year related to Unplanned System Expansion. EAPO is subject to inflation.

Pro-Forma Table 6B – Maximum Work Classification Rates – Evaluation Price Form

| Number | Work Classification | Maximum Work Classification Cost | Total Estimated Unplanned Hours | Value |
|--------|--|----------------------------------|---------------------------------|---------|
| | | (\$FY2017/hour) ¹ | (Evaluation Purposes) | = A x B |
| | Column Ref | (A) | (B) | (C) |
| 1 | System analysis | | 2,726 | - |
| 2 | System testing | | 1,817 | - |
| 3 | Software/system development | | 2,100 | - |
| 4 | Hardware development | | 1,016 | - |
| 5 | Hardware testing | | 748 | - |
| 6 | Hardware installation (Vehicle, etc.) | | 3,500 | - |
| 7 | System/software management, maintenance and configuration | | 690 | - |
| 8 | Retail partnership development | | 800 | - |
| 9 | Retail partnership management and stock delivery | | 800 | - |
| 10 | DB Oversight | | 2,160 | - |
| 11 | Preliminary Design | | 2,316 | - |
| 12 | Web design | | 2,700 | - |
| 13 | Web maintenance | | 1,350 | - |
| 14 | UI Design | | 380 | - |
| 15 | Payment Service Provider consulting | | 750 | - |
| 16 | Hardware maintenance | | 800 | - |
| 17 | Budgeting & Reporting | | 100 | - |
| 18 | Accessibility certification and compliance | | 374 | - |
| 19 | Order fulfillment | | 720 | - |
| 20 | Cash collection/counting | | 1,000 | - |
| 21 | MBTA Expansion coordination | | 120 | - |
| 22 | New providers expansion coordination | | 480 | - |
| 23 | Qualified Security Assessments | | 682 | - |
| 24 | Safety assessments | | 604 | - |
| 25 | Financial advisor | | 1,247 | - |
| 26 | Legal advisor | | 1,113 | - |
| 27 | Training instruction | | 374 | - |
| 28 | Project management | | 1,927 | - |
| 29 | Absolute maximum rate across all services, anything not defined above, or if uncertainty about role exists | | 3,339 | - |
| | Total | | 36,733 | - |

¹ Maximum Work Classification and associated hourly costs will be included as a table in Attachment 11-A of Appendix 11 (Unit Rates and Changes in Cost Methodology) Appendix 11 of the Project Agreement.

Pro-Forma Table 7 - Option Pricing & Expansion Evaluation Scenario¹

| No. | Option Description | Annual Change to APC (SFY2017) | | | Annual Change to APO (SFY2017) | | | One-off payment (SFY 2023) | Change to Other AP Transaction Rate (% MBTA Fare Revenue) | | Change to Other AP Transaction Rate (¢ per Transaction Unit) | |
|-----|---|--------------------------------|----------------|----------------|--------------------------------|----------------|----------------|----------------------------|---|---------------------------|--|---------------------------|
| | | Initial Term ² | Renewal Term 1 | Renewal Term 2 | Initial Term | Renewal Term 1 | Renewal Term 2 | | FVM - In-Station Cash | FVM - Out-of-Station Cash | FVM - In-Station Cash | FVM - Out-of-Station Cash |
| | Provision of Change to Users Annual Section 6.4 of Appendix 2.3 (Customer Facing Devices) to remove the requirement that all Customer-Facing Devices shall provide change to the Users. | | | | | | | N/A | | | | |
| | Unplanned System Expansion The MBTA requires for expansion purposes only that the Systems Integrator to increase the baseline proposal for all items included in Pro-Forma Table 6A by 35% based on the pricing provided in Pro-Forma Table 6A. ³ Proposers are to assume the additional equipment is all installed and available for use at the beginning of FY2023 and available for the remainder of the Initial Term. Proposers should assume the prices included in Proposal Form 6A. Indexed Linked in the following proportions: • 15% increase in number of units (rounded down) - purchased at the unit cost in band A • 10% increase in number of units (rounded down) - purchased at the unit cost in band B • 5% increase in number of units (rounded down) - purchased at the unit cost in band C • Remaining increase in number of units (5% plus rounded amounts) - purchased at the unit cost in band D The MBTA shall make full payment for Unit Costs and Unit Installation Costs on the first day of FY2023 by means of a one-off payment. The MBTA shall increase APO for the remainder of the Initial Term. (DO NOT calculate during Renewal Terms) Assume no change in assumptions from the base award (e.g. APT). | N/A | N/A | N/A | | | | | N/A | N/A | N/A | N/A |
| | No Planned Expansions Annual Section 2 of Appendix 2.8 (Expansions) to remove all Planned Expansions (the MBTA Location Expansions and Vehicle Expansions) | | | | | | | N/A | N/A | N/A | N/A | N/A |

(1) Positive numbers represent an increase in APC or APO; negative numbers represent a reduction in APC or APO in each period as provided in Pro-Forma Table 5i in each period.
 (2) Provide separate pricing for Initial Term, Renewal Term 1 and Renewal Term 2, unless specifically directed otherwise.
 (3) The MBTA has not provided an indication as to the total number of units procured due to the fact that this number may vary based on the Proposer's proposed technical solution.

Table 6

AP O&M by Month and Fiscal Year (FY17 \$) [1]

| Fiscal Year | July | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
|-------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2018 | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | |
| 2020 | | | | | | | | | | [2] | | |
| 2021 | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | |
| 2026 | | | | | | | | | | | | |
| 2027 | | | | | | | | | | | | |
| 2028 | | | | | | | | | | | | |
| 2029 | | | | | | | | | | | | |
| 2030 | | | | | | | | | | | | |
| 2031 | | | | | | | | | | | | |
| 2032 | | | | | | | | | | | | |
| 2033 | | | | | | | | | | | | |
| 2034 | | | | | | | | | | | | |
| 2035 | | | | | | | | | | | | |
| 2036 | | | | | | | | | | | | |
| 2037 | | | | | | | | | | | | |
| 2038 | | | | | | | | | | | | |
| 2039 | | | | | | | | | | | | |
| 2040 | | | | | | | | | | | | |
| 2041 | | | | | | | | | | [3] | | |

[1] Inputs to be calculated based on Systems Integrator Proposal to be updated based on the Notice to Award Date. All periods are to reflect a full Month and may be pro-rated within the Monthly Payment calculation worksheet.

[2] To the extent that the Revenue Service Commencement Date is achieved prior to the date assumed in the Financial Model, the APO payable (subject to inflation and adjustment in accordance with the Monthly Payment calculation worksheet) shall equal the average for the five (5) complete Fiscal Years from the Scheduled Full Service Commencement Date.

[3] To the extent a Supervening Event increases the Term of the Project, the additional Month's APO shall be the same as the preceding

Table 7

Total AP Transaction Rates based on MBTA Fare Revenue

| | Transaction Channel | Sources for MBTA Fare Revenue distribution by Transaction Channel | Allowable AP Transaction Rate (% MBTA Fare Revenue) | Other AP Transaction Rate (% MBTA Fare Revenue) | Total AP Transaction Rate (% MBTA Fare Revenue) |
|---|------------------------|---|---|---|---|
| | | | (A) | (B) | (C)=(A)+(B) |
| a | Bulk | ACH, check, or wire transfer and including any payments to an API Funds Pool or an APOS Funds Pool | 0.00% | 0.00% | 0.00% |
| b | PAYG Debit | Any Payment Card which is classified as a debit card by Payment Industry Standards, presented via Tap (directly or using an NFC Device) or in the Fare Card Mobile Application (when the payment made using the Fare Card Mobile Application is considered made in a “card present” manner by Payment Industry Standards) | 0.00% | 0.00% | 0.00% |
| c | PAYG Credit | Any Payment Card which is classified as a credit card by Payment Industry Standards, presented via Tap (directly or using an NFC Device) or in the Fare Card Mobile Application (when the payment made using the Fare Card Mobile Application is considered made in a “card present” manner by Payment Industry Standards) | 0.00% | 0.00% | 0.00% |
| d | Card Not Present Debit | Any Payment Card which is classified as a debit card by Payment Industry Standards, used on the System Website, IVR, the Fare Card Mobile Application (when the payment using the Fare Card Mobile Application is considered made in a “card not present” manner by Payment Industry Standards), and via any automatic renewal or top-up features (as described in Appendix 3.8). | 0.00% | 0.00% | 0.00% |

| | | | | | |
|---|-----------------------------|--|-------|-------|-------|
| e | Card Not Present Credit | Any Payment Card which is classified as a credit card by Payment Industry Standards, used on the System Website, IVR, the Fare Card Mobile Application (when the payment using the Fare Card Mobile Application is considered made in a “card not present” manner by Payment Industry Standards), and via any automatic renewal or top-up features (as described in Appendix 3.8). | 0.00% | 0.00% | 0.00% |
| f | FVM – In Station Debit | Any Payment Card which is classified as a debit card by Payment Industry Standards, used at an FVM located at a Station | 0.00% | 0.00% | 0.00% |
| g | FVM – In Station Credit | Any Payment Card which is classified as a credit card by Payment Industry Standards, used at an FVM located anywhere other than a Station | 0.00% | 0.00% | 0.00% |
| h | FVM – In Station | Cash used at any FVM located in a Station | 0.00% | 0.00% | 0.00% |
| i | FVM – Out of Station Debit | Any Payment Card which is classified as a debit card by Payment Industry Standards, used at an FVM located at a Station | 0.00% | 0.00% | 0.00% |
| j | FVM – Out of Station Credit | Any Payment Card which is classified as a credit card by Payment Industry Standards, used at an FVM located anywhere other than a Station | 0.00% | 0.00% | 0.00% |
| k | FVM – Out of Station Cash | Cash used at an FVM located anywhere other than a Station | 0.00% | 0.00% | 0.00% |
| l | Retail Reload Location | Any purchase by a User at a Retail Reload Location | 0.00% | 0.00% | 0.00% |

Table 8

Total AP Transaction Rates based on Transaction Units

| | Transaction Channel | Constitution of One (1) Transaction Unit | Allowable AP Transaction Rate (\$ per Transaction Unit) | Other AP Transaction Rate (\$ per Transaction Unit) | Total AP Transaction Rate (\$ per Transaction Unit) |
|---|---------------------|--|---|---|---|
| | | | (A) | (B) | (C)=(A)+(B) |
| a | Bulk | One (1) payment for Products or Value using ACH, check, or wire transfer and including any payments to an API Funds Pool or an APOS Funds Pool | - | - | - |
| b | PAYG Debit | One (1) Trip with an accepted Tap using a Contactless EMV Credential which is classified as a debit card by Payment Industry Standards, or one (1) transaction per Product successfully purchased using the Fare Card Mobile Application paid for with a Payment Card which is classified as a debit card by Payment Industry Standards, when the payment for that Product is considered made in a “card present” manner by Payment Industry Standards | - | - | - |
| c | PAYG Credit | One (1) Trip with an accepted Tap using a Contactless EMV Credential which is classified as a credit card by Payment Industry Standards, or one (1) transaction per Product successfully purchased using the Fare Card Mobile Application paid for with a Payment Card which is classified as a credit card by Payment Industry Standards, when the payment for that Product is considered made in a “card present” manner by Payment Industry Standards | - | - | - |

| | | | | | |
|---|-------------------------|--|---|---|---|
| d | Card Not Present Debit | One (1) User Session in the System Website, IVR or Fare Card Mobile Application (when the payment using the Fare Card Mobile Application is considered made in a “card not present” manner by Payment Industry Standards) that includes the successful paid purchase of a Product paid for with a Payment Card which is classified as a debit card by Payment Industry Standards, or one (1) successful paid purchase of a Product via automatic top-up or renewal (as described in Appendix 3.8) paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | - | - | - |
| e | Card Not Present Credit | One (1) User Session in the System Website, IVR or Fare Card Mobile Application (when the payment using the Fare Card Mobile Application is considered made in a “card not present” manner by Payment Industry Standards) that includes the successful paid purchase of a Product paid for with a Payment Card which is classified as a credit card by Payment Industry Standards, or one (1) successful paid purchase of a Product via automatic top-up or renewal (as described in Appendix 3.8) paid for with a Payment Card which is classified as a credit card by Payment Industry Standards | - | - | - |
| f | FVM – In Station Debit | One (1) User Session at an FVM located in a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | - | - | - |
| g | FVM – In Station Credit | One (1) User Session at an FVM located in a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | - | - | - |

| | | | | | |
|---|-----------------------------------|---|---|---|---|
| h | FVM – In Station Cash | One (1) User Session at an FVM located in a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with cash | - | - | - |
| i | FVM – Out of Station Debit | One (1) User Session at an FVM located anywhere other than a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | - | - | - |
| j | FVM – Out of Station Credit | One (1) User Session at an FVM located anywhere other than a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | - | - | - |
| k | FVM – Out of Station Cash | One (1) User Session at an FVM located anywhere other than a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with cash | - | - | - |
| l | Retail Reload Location | One (1) User Session at a Retail Reload Location with a successful paid purchase of one or more Products or payment of one or more Enablement Fees. | - | - | - |
| m | Standard Fare Card Enablements | One (1) Standard Fare Card which is Enabled by way of a User paying the Enablement Fee Configured by MBTA, or One (1) Standard Fare Card which is Enabled by way of the MBTA waiving the Enablement Fee, or One (1) Standard Fare Card which is Enabled by way of Fare Policy and Configuration allowing the transfer of an Enabled status from one Fare Card to another. | - | - | - |

| | | | | | |
|---|-------------------------------------|--|---|---|---|
| n | Temporary Fare Card Enablements [1] | One (1) Temporary Fare Card which is Enabled by way of a User paying the Enablement Fee Configured by MBTA, or One (1) Temporary Fare Card which is Enabled by way of the MBTA waiving the Enablement Fee, or One (1) Temporary Fare Card which is Enabled by way of Fare Policy and Configuration allowing the transfer of an Enabled status from one Fare Card to another. | - | - | - |
|---|-------------------------------------|--|---|---|---|

[1] The Temporary Fare Card Enablements Allowable AP Transaction Rate, Other AP Transaction Rate and Total AP Transaction Rate will be populated upon the Effective Date at 25% of the corresponding rate for Standard Fare Card Enablements, rounded up to the nearest 1 cent.

PROPOSAL FORM 15

STATE CERTIFICATIONS

By submitting a Proposal, Proposer makes the following certifications and assurances under the pains and penalties of perjury, agrees to provide any required documentation upon request to support compliance, and agrees that all terms governing performance of the Project Agreement and doing business in Massachusetts are attached or incorporated by reference herein:

Qualifications. The Systems Integrator certifies it is qualified and shall at all times remain qualified to perform the Contract Services; that performance shall be timely and meet or exceed industry standards for the performance required, including obtaining requisite licenses, registrations, permits, resources for performance, and sufficient professional, liability; and other appropriate insurance to cover the performance. If the Systems Integrator is a business, the Systems Integrator certifies that it is listed under the Secretary of State's website as licensed to do business in Massachusetts, as required by law.

Business Ethics and Fraud, Waste and Abuse Prevention. The Systems Integrator certifies that performance under the Project Agreement, in addition to meeting the terms of the Project Agreement, will be made using ethical business standards and good stewardship of taxpayer and other public funding and resources to prevent fraud, waste and abuse.

Collusion. The Systems Integrator certifies that the Project Agreement has been offered in good faith and without collusion, fraud or unfair trade practices with any other person, that any actions to avoid or frustrate fair and open competition are prohibited by law, and shall be grounds for rejection or disqualification of a Response or termination of the Project Agreement.

Public Records and Access. The Systems Integrator shall provide full access to records related to performance and compliance to the MBTA pursuant to G.L. c. 11, s.12 for seven (7) years beginning on the first day after the final payment under the Project Agreement or such longer period necessary for the resolution of any litigation, claim, negotiation, audit or other inquiry involving the Project Agreement. Access to view Systems Integrator records related to any breach or allegation of fraud, waste and/or abuse may not be denied and Systems Integrator cannot claim confidentiality or trade secret protections solely for viewing but not retaining documents. Routine Project Agreement performance compliance reports or documents related to any alleged breach or allegation of non-compliance, fraud, waste, abuse or collusion may be provided electronically and shall be provided at Systems Integrator's own expense. Reasonable costs for copies of non-routine Project Agreement related records shall not exceed the rates for public records under the Massachusetts Public Records Law.

Debarment. The Systems Integrator certifies that neither it nor any of its subcontractors are currently debarred or suspended by the federal or state government under any law or regulation.

Applicable Laws. The Systems Integrator shall comply with all applicable state laws and regulations including but not limited to the applicable Massachusetts General Laws; Code of Massachusetts Regulations 801 CMR 21.00 (Procurement of Commodity and Service Procurements); M G.L. c. 66A; and the Massachusetts Constitution Article XVIII if applicable.

Tax Law Compliance. The Systems Integrator certifies under the pains and penalties of perjury tax compliance with Federal tax laws; state tax laws including but not limited to G.L. c. 62C, G.L. c. 62C, s. 49A; compliance with all state tax laws, reporting of employees and Systems Integrator, withholding and remitting of tax withholdings and child support and is in good standing with respect to all state taxes and returns due; reporting of employees and Systems Integrators under G.L. c. 62E, withholding and remitting

child support including G.L. c. 119A, s. 12; TIR 05-11; New Independent Systems Integrator Provisions and applicable TIRs.

Bankruptcy, Judgments, Potential Structural Changes, Pending Legal Matters and Conflicts. The Systems Integrator certifies it has not been in bankruptcy and/or receivership within the last three calendar years, and the Systems Integrator certifies that it will immediately notify the Department in writing at least 45 days prior to filing for bankruptcy and/or receivership, any potential structural change in its organization, or if there is any risk to the solvency of the Systems Integrator that may impact the Systems Integrator's ability to timely fulfill the terms of this Project Agreement. The Systems Integrator certifies that at any time during the Term the Systems Integrator is required to affirmatively disclose in writing to the Department Contract Manager the details of any judgment, criminal conviction, investigation or litigation pending against the Systems Integrator or any of its officers, directors, employees, agents, or subcontractor, including any potential conflicts of interest of which the Systems Integrator has knowledge, or learns of during the Term. Law firms or Attorneys providing legal services are required to identify any potential conflict with representation of any Department client in accordance with Massachusetts Board of Bar Overseers (BBO) rules.

Protection of Personal Data and Information. The Systems Integrator certifies that all steps will be taken to ensure the security and confidentiality of all Commonwealth data for which the Systems Integrator becomes a holder, either as part of performance or inadvertently during performance, with special attention to restricting access, use and disbursement of personal data and information under G.L. c. 93H and c. 66A. The Systems Integrator is required to comply with G.L. c. 93I for the proper disposal of all paper and electronic media, backups or systems containing personal data and information, provided further that the Systems Integrator is required to ensure that any personal data or information transmitted electronically or through a portable device be properly encrypted using (at a minimum) Information Technology Division (ITD) Protection of Sensitive Information, provided further that any Systems Integrator having access to credit card or banking information of Commonwealth customers certifies that the Systems Integrator is compliant with applicable PCI Security Standards Council (PCI-SSC) standards as described in Appendix 3.1 to the Draft Project Agreement and shall provide confirmation of compliance during the Term, provide further that the Systems Integrator shall immediately notify the MBTA in the event of any security breach including the unauthorized access, disbursement, use or disposal of personal data or information, and in the event of a security breach, the Systems Integrator shall cooperate fully with the MBTA and provide access to any information necessary for the MBTA to respond to the security breach and shall be fully responsible for any damages associated with the Systems Integrator's breach including but not limited to G.L. c. 214, s. 3B.

Corporate and Business Filings and Reports. The Systems Integrator certifies compliance with any certification, filing, reporting and service of process requirements of the Secretary of and other Departments as related to its conduct of business in the Commonwealth; and with its incorporating state (or foreign entity).

Employer Requirements. The Project contractors that are employers certify compliance with applicable state and federal employment laws or regulations, including but not limited to G.L. c. 5, s. 1 (Prevailing Wages for Printing and Distribution of Public Documents); G.L. c. 7, s. 22 (Prevailing Wages for Contracts for Meat Products and Clothing and Apparel); minimum wages and prevailing wage programs and payments; unemployment insurance and contributions; workers' compensation and insurance, child labor laws, AGO fair labor practices; G.L. c. 149 (Labor and Industries); G.L. c. 150A (Labor Relations); G.L. c. 151 and 455 CMR 2.00 (Minimum Fair Wages); G.L. c. 151A (Employment and Training); G. L. c. 151B (Unlawful Discrimination); G.L. c. 151E (Business Discrimination); G.L. c. 152 (Workers' Compensation); G.L. c.153 (Liability for Injuries); 29 USC c. 8 (Federal Fair Labor Standards); 29 USC c. 28 and the Federal Family and Medical Leave Act.

Federal And State Laws And Regulations Prohibiting Discrimination including but not limited to the Federal Equal Employment Opportunity (EEO) Laws the Americans with Disabilities Act,; 42 U.S.C Sec. 12,101, et seq., the Rehabilitation Act, 29 USC c. 16 s. 794; 29 USC c. 16. s. 701; 29 USC c. 14, 623; the 42 USC c. 45; (Federal Fair Housing Act); G. L. c. 151B (Unlawful Discrimination); G.L. c. 151E (Business Discrimination); the Public Accommodations Law G.L. c. 272, s. 92A; G.L. c. 272, s. 98 and 98A, Massachusetts Constitution Article CXIV and G.L. c. 93, s. 103; 47 USC c. 5, sc. II, Part II, s. 255 (Telecommunication Act; Chapter 149, Section 105D, G.L. c. 151C, G.L. c. 272, Section 92A, Section 98 and Section 98A, and G.L. c. 111, Section 199A, and Massachusetts Disability-Based Non-Discrimination Standards For Executive Branch Entities, and related Standards and Guidance, authorized under Massachusetts Executive Order or any disability-based protection arising from state or federal law or precedent. See also MCAD and MCAD links and Resources.

Small Business Purchasing Program (SBPP). The Systems Integrator may be eligible to participate in the SBPP, created pursuant to Executive Order 523, if qualified through the SBPP COMMBUYS subscription process at: www.commbuys.com and with acceptance of the terms of the SBPP participation agreement.

Indemnification. The term “other damages” shall include, but shall not be limited to, the reasonable costs the MBTA incurs to repair, return, replace or seek cover (purchase of comparable substitute commodities and services) under a Contract. “Other damages” shall not include damages to the MBTA as a result of third party claims, provided, however, that the foregoing in no way limits the MBTA’s right of recovery for personal injury or property damages or patent and copyright infringement under Section 11 nor the MBTA’s ability to join the Systems Integrator as a third party defendant. Further, the term “other damages” shall not include, and in no event shall the Systems Integrator be liable for, damages for the MBTA’s use of Systems Integrator provided products or services, loss of MBTA records, or data (or other intangible property), loss of use of equipment, lost revenue, lost savings or lost profits of the MBTA. In no event shall “other damages” exceed the greater of \$100,000, or two times the value of the product or service (as defined in the contract scope of work) that is the subject of the claim. Nothing in this section shall limit the MBTA’s ability to negotiate higher limitations of liability in a particular Contract, provided that any such limitation must specifically reference Section 11 of the MBTA Terms and Conditions. In the event the limitation of liability conflicts with accounting standards which mandate that there can be no cap of damages, the limitation shall be considered waived for that audit engagement.

Northern Ireland Certification. Pursuant to G.L. c. 7 s. 22C for state agencies, state authorities, the House of Representatives or the state Senate, by signing the Project Agreement the Systems Integrator certifies that it does not employ ten or more employees in an office or other facility in Northern Ireland and if the Systems Integrator employs ten or more employees in an office or other facility located in Northern Ireland the Systems Integrator certifies that it does not discriminate in employment, compensation, or the terms, conditions and privileges of employment on account of religious or political belief; and it promotes religious tolerance within the work place, and the eradication of any manifestations of religious and other illegal discrimination; and the Systems Integrator is not engaged in the manufacture, distribution or sale of firearms, munitions, including rubber or plastic bullets, tear gas, armored vehicles or military aircraft for use or deployment in any activity in Northern Ireland.

Pandemic, Disaster or Emergency Performance. In the event of a serious emergency, pandemic or disaster outside the control of the MBTA, the MBTA may negotiate emergency performance from the Systems Integrator to address the immediate needs of the Commonwealth even if not contemplated under the original Contract or procurement. Payments are subject to appropriation and other payment terms.

Subcontractor Performance. The Systems Integrator certifies full responsibility for Contract performance, including subcontractors, and that comparable Contract terms will be included in

subcontracts, and that the Department will not be required to directly or indirectly manage subcontractors or have any payment obligations to subcontractors.

For covered Executive state Departments, the Systems Integrator certifies compliance with applicable Executive Orders (see also Massachusetts Executive Orders), including but not limited to the specific orders listed below. A breach during period of a Contract may be considered a material breach and subject Systems Integrator to appropriate monetary or Contract sanctions.

Executive Order 481. Prohibiting the Use of Undocumented Workers on State Contracts. For all state agencies in the Executive Branch, including all executive offices, boards, commissions, agencies, Departments, divisions, councils, bureaus, and offices, now existing and hereafter established, by signing the Project Agreement the Systems Integrator certifies under the pains and penalties of perjury that they shall not knowingly use undocumented workers in connection with the performance of the Project Agreement; that, pursuant to federal requirements, shall verify the immigration status of workers assigned to a Contract without engaging in unlawful discrimination; and shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker.

Executive Order 130. Anti-Boycott. The Systems Integrator warrants, represents and agrees that during the time the Project Agreement is in effect, neither it nor any affiliated company, as hereafter defined, participates in or cooperates with an international boycott (See IRC § 999(b)(3)- (4), and IRS Audit Guidelines Boycotts) or engages in conduct declared to be unlawful by G.L. c. 151E, s. 2. A breach in the warranty, representation, and agreement contained in this paragraph, without limiting such other rights as it may have, the Commonwealth shall be entitled to rescind the Project Agreement. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the Systems Integrator or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interests of the Systems Integrator, or which directly or indirectly owns at least 51% of the ownership interests of the Systems Integrator.

Executive Order 346. Hiring of State Employees By State Contractors. The Systems Integrator certifies compliance with both the conflict of interest law G.L. c. 268A specifically s. 5 (f) and this order; and includes limitations regarding the hiring of state employees by private companies contracting with the Commonwealth. A privatization contract shall be deemed to include a specific prohibition against the hiring at any time during the term of Contract, and for any position in the Systems Integrator's company, any state management employee who is, was, or will be involved in the preparation of the RFP, the negotiations leading to the awarding of the Contract, the decision to award the Contract, and/or the supervision or oversight of performance under the Contract.

Executive Order 444. Disclosure of Family Relationships With Other State Employees. Each person applying for employment (including Contract work) within the Executive Branch under the Governor must disclose in writing the names of all immediate family related to immediate family by marriage who serve as employees or elected officials of the Commonwealth. All disclosures made by applicants hired by the Executive Branch under the Governor shall be made available for public inspection to the extent permissible by law by the official with whom such disclosure has been filed.

Executive Order 504. Regarding the Security and Confidentiality of Personal Information. For all Contracts involving the Systems Integrator's access to personal information, as defined in G.L. c. 93H, and personal data, as defined in G.L. c. 66A, owned or controlled by Executive Department agencies, or access to agency systems containing such information or data (herein collectively "personal information"), Systems Integrator certifies under the pains and penalties of perjury that the Systems Integrator (1) has read Commonwealth of Massachusetts Executive Order 504 and agrees to protect any and all personal information; and (2) has reviewed all of the Commonwealth Information Technology

Division's Security Policies. Notwithstanding any contractual provision to the contrary, in connection with the Systems Integrator's performance under the Project Agreement, for all state agencies in the Executive Department, including all executive offices, boards, commissions, agencies, departments, divisions, councils, bureaus, and offices, now existing and hereafter established, the Systems Integrator shall: (1) obtain a copy, review, and comply with the contracting agency's Information Security Program (ISP) and any pertinent security guidelines, standards, and policies; (2) comply with all of the Commonwealth of Massachusetts Information Technology Division's "Security Policies") (3) communicate and enforce the contracting agency's ISP and such Security Policies against all employees (whether such employees are direct or contracted) and subcontractor; (4) implement and maintain any other reasonable appropriate security procedures and practices necessary to protect personal information to which the Systems Integrator is given access by the contracting agency from the unauthorized access, destruction, use, modification, disclosure or loss; (5) be responsible for the full or partial breach of any of these terms by its employees (whether such employees are direct or contracted) or subcontractors during or after the term of the Project Agreement, and any breach of these terms may be regarded as a material breach of the Project Agreement; (6) in the event of any unauthorized access, destruction, use, modification, disclosure or loss of the personal information (collectively referred to as the "unauthorized use"): (a) immediately notify the contracting agency if the Systems Integrator becomes aware of the unauthorized use; (b) provide full cooperation and access to information necessary for the contracting agency to determine the scope of the unauthorized use; and (c) provide full cooperation and access to information necessary for the contracting agency and the Systems Integrator to fulfill any notification requirements. Breach of these terms may be regarded as a material breach of the Project Agreement, such that the Commonwealth may exercise any and all contractual rights and remedies, including without limitation indemnification under Section 11 of the Commonwealth's Terms and Conditions, withholding of payments, Contract suspension, or termination. In addition, the Systems Integrator may be subject to applicable statutory or regulatory penalties, including and without limitation, those imposed pursuant to G.L. c. 93H and under G.L. c. 214, § 3B for violations under M.G.L c. 66A. Executive Orders 523, 524 and 526. Executive Order 526 (Order Regarding Non- Discrimination, Diversity, Equal Opportunity and Affirmative Action which supersedes Executive Order 478). Executive Order 524 (Establishing the Massachusetts Supplier Diversity Program which supersedes Executive Order 390). Executive Order 523 (Establishing the Massachusetts Small Business Purchasing Program.) All programs, activities, and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background. The Systems Integrator and any subcontractors may not engage in discriminatory employment practices; and the Systems Integrator certifies compliance with applicable federal and state laws, rules, and regulations governing fair labor and employment practices.

The undersigned hereby certifies that the Proposer, if awarded the Project Agreement, shall comply with the requirements stated above.

PROPOSER'S NAME: _____

AUTHORIZED SIGNATURE: _____

TITLE: _____

DATE: _____

PROPOSAL FORM 16

SECURITY CERTIFICATION

The Systems Integrator will comply with the MBTA's Security Requirements as stated herein. The Systems Integrator shall:

- Submit a complete list of Systems Integrator's employees, subcontractors, and agents that will perform work for the MBTA under the Project Agreement. This list must be submitted prior to eligibility consideration for payment of delivery or completion of the first milestone. At a minimum, the list shall include:
 - Name and Employee Number/Identifier
 - Address
 - Job Title
 - Hours and Location of Work

Note: Immediate notification, in writing, is required for listed employees, subcontractors, and agents who leave Systems Integrator's (direct or indirect) employment and/or any new employees, subcontractors or agents who are to be added to this list. Systems Integrator is required to provide, upon request by the MBTA, periodic updates of the list throughout the Term.

- Conduct for all current and future employees performing work under the Project Agreement, a legally available criminal background check, including a Criminal Offender Record Information (CORI) background check with the Massachusetts Criminal History Systems Board and a driver's history check with the Massachusetts Registry of Motor Vehicles (if applicable). The CORI check shall include a Level II Sex Offenders Registry check. To the extent not already available to the Systems Integrator, the Systems Integrator shall apply for and make best efforts to obtain CORI access. This shall include requiring employees to obtain their own CORI check if the employer is unable to gain access to CORI. The Systems Integrator shall provide written documentation to the Authority that demonstrates the Systems Integrator's compliance with the aforementioned requirements. Furthermore, the Systems Integrator shall conduct these background and driver history checks least ~~once~~ every two (2) years, or as otherwise specified by the MBTA. Any employee of the Systems Integrator's with a history that includes a felony conviction, any conviction for theft, or who appears otherwise unsuitable to perform the work that is the subject of this solicitation throughout the term this Agreement or any extensions thereof, **shall not** be assigned by the Systems Integrator to perform work under this Agreement.

The MBTA reserves the right to have MBTA Transit Police perform the required background checks, and shall promptly notify the Systems Integrator in writing of any such action.

- Distribute an MBTA-issued photograph identification badges to all Systems Integrator employees, subcontractors, and agents who work on MBTA property. The badge shall have the name and a recent photograph of the employee, subcontractor or agent (i.e., within last three (3) years). The following information shall be listed on the back of the identification badge: training certifications, safety training, and other related security training required by the MBTA. No employee, subcontractor or agent of the Systems Integrator will be allowed on MBTA property without wearing the MBTA-issued identification badge.
- Ensure that Systems Integrator’s employees, subcontractors, and agents:
 - Are not allowed on MBTA property except as required for stated work;
 - Are not allowed on MBTA property before and after service hours unless explicitly, contractually required to be there; and
 - Are forbidden from carrying firearms on MBTA property.

SECURITY REQUIREMENTS

- Provide to the MBTA, upon its request, any documents that pertain to:
 - Systems Integrator employee, subcontractor or agent conduct on MBTA property;
 - Security training; and
 - Monitoring/auditing of Systems Integrator employees or agents while on MBTA property.
- If at any time during the term of this Agreement, and also during any and all extensions thereof, the MBTA establishes new or revised security policies and procedures as they relate to the Systems Integrator’s performance under this Agreement, the Systems Integrator shall comply with such policies and procedures as deemed reasonable by the MBTA and the Systems Integrator.

SECURITY REQUIREMENTS CERTIFICATION

The undersigned hereby certifies that the Proposer, if awarded the Project Agreement, shall comply with the MBTA’s Security Requirements as stated above.

PROPOSER'S NAME: _____

AUTHORIZED SIGNATURE: _____

TITLE: _____

DATE: _____

PROPOSAL FORM 17

**SECURITY SENSITIVE INFORMATION – NON-DISCLOSURE AND
CONFIDENTIALITY AGREEMENT**

**Massachusetts Bay Transportation Authority
Security Sensitive Information
Non- Disclosure and Confidentiality Agreement**

I certify that I am receiving information from the Massachusetts Bay Transportation Authority (the "Authority") to assist with generating initial estimates for the AFC 2.0 project. I certify my understanding that the material to be received pertains to Authority assets and infrastructure that have been deemed critical or important to operations, and are considered security sensitive information, exempted from public disclosure, pursuant to 49 U.S.C. 40119(b)(1) and 49 CFR 15.5(b)(16), and M.G.L. c. 4, § 7(26)(n). I have been authorized by the Authority to receive the security sensitive information in the form of plans, reports, surveys, AutoCAD files or any other information in any form (the "Records"). This authorization is granted based upon compliance with the following conditions and agreements.

I agree that the Records are of a highly confidential and security sensitive nature and that such information shall only be used for generating initial estimates for the AFC 2.0 project. I will not make any use of the Records for any purpose other than as expressly permitted by this Agreement.

I agree that, except as required by law, I will hold and treat the Records in the strictest confidence and will not, without the prior written consent of an authorized representative of the Authority, directly or indirectly discuss with, disclose, release, or otherwise provide or make available the data contained in the Records or any portion thereof, to any person other than authorized persons who have a need to review the Records and have executed an Massachusetts Bay Transportation Authority Security Sensitive Information Non- Disclosure and Confidentiality Agreement in connection with generating initial estimates for the AFC 2.0 project.

I agree to maintain the security of all documents, working papers, designs, and other materials related to the Records and I will password protect all such information stored by me in electronic form.

I agree that if at any time I discover that any of the Records has been inappropriately disclosed, I will immediately report the same to the Authority.

Upon the earlier of the Authority's written request or completion of my need for such information, the Records and all copies thereof, shall be promptly delivered to the Authority. I agree to destroy all electronic copies in a manner acceptable to the Authority. To the extent that any writings and materials describing, analyzing or containing any data contained in the Records is produced by me, I acknowledge that I have an ongoing perpetual obligation to protect such data from disclosure unless prior written authorization is obtained from the Authority.

I agree that my obligations under this Agreement will be perpetual.

If I am served with a subpoena or discovery request or receive a public records disclosure request relating to, or am otherwise required by law to disclose any Record, I will immediately provide the Authority with written notification and provide a copy to the Authority to permit the Authority to seek a protective order or take other appropriate action. I will also cooperate in the Authority's efforts to obtain a protective order or other assurance that secure treatment will be afforded the Records. In the absence of the protective order, I may disclose to the party compelling the disclosure only the part of the Records as is required to be disclosed (in which case, prior to such disclosure, I will advise and consult with the Authority as to such disclosure and the nature and wording of the such disclosure) and I will use my best efforts to obtain confidential treatment thereof.

I acknowledge that the unauthorized disclosure and handling of the Records could cause substantial damage and expose the Authority and its facilities and customers to significant danger and could result in civil or criminal fines and penalties.

I acknowledge that the obligations of confidence required hereunder are extraordinary and unique and are vital to the security and well-being of the Authority and its customers and that damages at law may be an inadequate remedy for any breach or threatened breach of this Agreement. The Authority shall be entitled, in addition to all other rights or remedies, to seek injunctions restraining such breach, without being required to show any actual damage or to post any bond or other security.

This Agreement shall be governed by and construed in accordance with laws of the Commonwealth of Massachusetts, without reference to its conflicts of laws principles.

Signature: _____

Date: _____

Name of Signatory: _____

Title of Signatory: _____

Entity Name: _____

Phone Number: _____

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PROPOSAL FORM 18

**SECURITY SENSITIVE INFORMATION – CERTIFICATION AND CONDITIONS OF
CUSTODY**

**Massachusetts Bay Transportation Authority
Security Sensitive Information
Certification and Conditions of Custody**

The undersigned certifies that it is receiving information from the Massachusetts Bay Transportation Authority (the "Authority") pursuant to a request for information, documents and records to assist with generating initial estimates for the AFC 2.0 project. The undersigned certifies its understanding that the material to be received pertains to Authority assets and infrastructure that have been deemed critical or important to operations, and are considered security sensitive information, exempted from public disclosure, pursuant to 49 U.S.C. 40119(b)(1) and 49 CFR 15.5(b)(16), and M.G.L. c. 4, § 7(26)(n). The undersigned has been authorized by the Authority to receive the security sensitive information in the form of plans, reports, surveys, AutoCAD files or any other information in any form (the "Records"). This authorization is granted based upon compliance with the following conditions.

The undersigned certifies that the Records are being made available for the limited and stated purpose in the original request to assist with generating initial estimates for the AFC 2.0 project, and are not to be disclosed to unauthorized persons, without written authorization of the Authority. The undersigned confirms it may be subject to penalty if the Records are released.

The undersigned certifies that access to the Records will be limited to those persons, including its employees, consultants and contractors, who have been designated by the undersigned as having a need to review the Records in order to successfully provide services or perform applicable tasks ("Authorized Personnel"). The undersigned certifies that it has established a protocol to ensure persons with access to the Records have the proper credentials and background to view and perform services involving security sensitive information; and has developed a protocol to record and limit access, reproductions and distribution of the Records to Authorized Personnel; and will continue to safeguard the Records even after it has completed work associated with the Records. Upon the earlier of the completion of its work or when the Records are no longer needed or upon written request of the Authority, the undersigned agrees to return all Records and copies thereof as well as all and any copies thereof to the Authority and to destroy all electronic copies in a manner acceptable to the Authority.

The undersigned certifies that it has developed proper safeguards and records management procedures to insulate the Records from inappropriate or unauthorized disclosure. The undersigned agrees that it will make good faith efforts to safeguard and not disclose the contents of, or copy or duplicate, any of the Records. Disclosure of documents or the information contained there to any other party other than Authorized Personnel in whole or in part or in any document created by the undersigned, or the issuance of statements to the public regarding limited access to the Records is strictly prohibited and shall require prior written authorization and approval from the Authority. To the extent that any writings and materials describing,

analyzing or containing any data contained in the Records is produced by the undersigned, the undersigned acknowledges that it has an ongoing perpetual obligation to protect such data from disclosure unless prior written authorization is obtained from the Authority.

The undersigned agrees that if at any time it discovers that any of the Records has been inappropriately disclosed, the undersigned will immediately report the same to the Authority.

The undersigned certifies that it will advise its own employees, agents, contractors, consultants or any other third party of the nondisclosure obligation and ensure compliance with the obligation. The undersigned agrees that prior to granting any access to any Authorized Personnel other than its own employees, it will obtain a certification in the same form as this certification from any entity utilizing said Authorized Personnel. The undersigned also agrees that prior to granting any access to any Authorized Personnel it will obtain a Massachusetts Bay Transportation Authority Security Sensitive Information Non- Disclosure and Confidentiality Agreement (“NDA”) from that person.

Original certifications from all entities utilizing Authorized Personnel and original NDAs from all Authorized Personnel must be provided to the Authority before the Records will be released. If following release of the Records, additional Authorized Personnel are identified, original certifications and NDAs must be delivered to the Authority before the Records are released to the additional Authorized Personnel.

The undersigned confirms that failure to make good faith efforts to comply with these conditions for the approved limited purposes, including the disclosure, copying and/or duplication of information contained in the Records in whole or in part to unauthorized persons, without written authorization of the Authority, may result in the revocation of custody of the Records and/or other penalties. The Authority shall be entitled, in addition to all other rights or remedies, to seek injunctions restraining such breach, without being required to show any actual damage or to post any bond or other security.

The undersigned agrees that if served with a subpoena or discovery request or receive a public records disclosure request relating to, or if otherwise required by law to disclose any Record, the undersigned will immediately provide the Authority with written notification and provide a copy to the Authority to permit the Authority to seek a protective order or take other appropriate action. The undersigned agrees to cooperate in the Authority’s efforts to obtain a protective order or other assurance that secure treatment will be afforded the Records. In the absence of the protective order, the undersigned may disclose to the party compelling the disclosure only the part of the Records as is required to be disclosed (in which case, prior to such disclosure, the undersigned will advise and consult with the Authority as to such disclosure and the nature and wording of the such disclosure) and the undersigned will use best efforts to obtain confidential treatment thereof.

The following conditions shall apply to any AutoCAD file supplied by the Authority. All documents, files or other data accessible from this file are provided solely as a courtesy to facilitate access to information. The Authority provides such documents, files or other data “as is” without any warranty of any kind, either expressed or implied, including but not limited to, accuracy, reliability, omissions, completeness and currentness. The Authority and its consultants shall not be liable for any claim for damages, including lost profits or other consequential, exemplary, incidental, indirect or special damages, relating in any way to the documents, files or other data accessible from this file, including, but not limited to, claims arising out of or related to electronic access or transmission of data or viruses. Because data stored on electronic media can deteriorate undetected or be modified without our knowledge, the Authority cannot be held liable for its completeness or correctness. The Authority makes no representation as to the compatibility of these files. The undersigned understands that this authorization does not give the undersigned the right to distribute the files.

This Agreement shall be governed by and construed in accordance with laws of the Commonwealth of Massachusetts, without reference to its conflicts of laws principles.

The undersigned understands and accepts the conditions of custody relative to receipt and the possession of the Records.

Entity Name: _____

Signature: _____

Date: _____

Name of Authorized Signatory: _____

Phone Number: _____

Address: _____

PROPOSAL FORM 19
STIPEND AGREEMENT

This Stipend Agreement (the “**Agreement**”) is made and entered into as of _____, 2017, between the Massachusetts Bay Transportation Authority (the “**MBTA**”), a body politic and corporate and a political subdivision of the Commonwealth of Massachusetts (the “**Commonwealth**”), and _____, a _____ organized and existing under the laws of the State of _____ and authorized to do business in the Commonwealth (the “**Consultant**”).

RECITALS

The MBTA is currently procuring a contract for the implementation of a new automated, account-based open fare collections system (the “**System**”).

The MBTA issued a request for qualifications (“**RFQ**”) on July 18, 2016, in order to prequalify or short-list the teams eligible to submit proposals to design, implement, install, integrate, test, finance, operate, maintain and manage the System (the “**Contract Services**”) (taken together with the System, the “**Project**”).

Following evaluation of the statements of qualifications submitted in response to the RFQ, and based upon the criteria set forth in the RFQ, four teams (including Consultant; each of the four a “**Proposer**”) were selected to receive the request for proposals (“**RFP**”), issued on November 15, 2016, as amended, for the Project.

Consultant intends to prepare and submit a proposal for the Project in response to the RFP (the “**Proposal**”).

The MBTA intends to select one of the Proposers (the “**Systems Integrator**”) to enter into an agreement for the implementation of the Project (the “**Project Agreement**”) based on the selection criteria stated in the RFP.

The MBTA, as part of its procurement of the Project, and subject to and pursuant to the terms and conditions of this Agreement, is offering a stipend to Proposers that submit a responsive Proposal and are not awarded the Project Agreement.

In order to be eligible to receive a stipend in connection with the procurement of the Project, a Proposer is required to enter into a stipend agreement with the MBTA for compensation for the provision of certain work product, as further set forth in this Agreement.

In consideration of the mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which are hereby expressly acknowledged by each of the parties hereto, the parties hereto, intending to be legally bound, agree as follows:

SECTION 1. DEFINITIONS. All capitalized terms used in this Agreement and not otherwise defined have the meanings ascribed to such terms in the RFP.

SECTION 2. SERVICES. Consultant, as a Proposer, shall prepare a responsive Proposal in response to the RFP. A “responsive” Proposal means a Technical Proposal submitted by a Proposer which conforms in all material respects to the requirements of the RFP, as determined by the MBTA, in its sole discretion, and is timely received by the MBTA.

SECTION 3. PERFORMANCE OF WORK. Consultant, as a Proposer, and its team members may design the System; furnish data, information, intellectual property, innovation, technology, techniques, methods, processes, unique uses of commercial items, solutions, construction means and methods, Project execution approaches, reports, concepts and other ideas relating to the Project; prepare drawings, plans and specifications for the Project; and submit a Proposal for the Project based on such work, pursuant to and in accordance with the terms of the RFP. Subject to the provisions of the RFP, all work performed by Consultant and its team members pursuant to this Agreement and in connection with the Proposal shall be considered work for hire and all product resulting from such work (the “**Proposal Work Product**”) shall become the property of MBTA without restriction or limitation on their use. Neither Consultant nor any of its team members shall copyright any of the material developed under this Agreement.

SECTION 4. TERM. Unless otherwise provided herein, the provisions of this Agreement shall remain in full force and effect until the earlier to occur of (a) 18 months from the date of the execution of this Agreement or (b) the date payment is delivered hereunder. The Proposal Work Product is due no later than the Proposal Submittal Date (as described below).

SECTION 5. STIPEND.

(A) Project Agreement Awarded to Another Proposer. If, following receipt of Proposals as requested by the RFP, the MBTA awards the Project Agreement to a Proposer, other than Consultant, that enters into the Project Agreement, the MBTA agrees to pay Consultant for the herein described services, and as full and final payment for the Proposal Work Product, a lump sum in an amount equal to (but not to exceed) \$500,000 (the “**Stipend**”), subject to the terms of this Agreement. Consultant will not be compensated if the Proposal is determined by MBTA to be nonresponsive, as defined above, fails to satisfy any of the other conditions set forth in Section 6 of this Agreement, or if MBTA withdraws the RFP prior to the Proposal Submittal Date (as described below).

(B) Procurement Cancelled by the MBTA Prior to Proposal Submittal Date. If the MBTA cancels the procurement of the Project for any reason prior to the Technical Proposal due date and time specified in the RFP, as such due date and time may be amended by addenda to the RFP (such due date and time being the “**Proposal Submittal Date**”), then Consultant shall not be entitled to any Stipend or any other payment for the Proposal Work Product.

(C) Project Agreement Not Awarded by the MBTA Following Proposal Submittal Date. If the MBTA cancels the procurement of the Project for any reason following the Proposal Submittal Date, or the MBTA does not execute an Early Works Agreement or Project Agreement within 180 days following the Proposal Submittal Date or any longer period agreed to by the MBTA and the Selected Proposer, then the MBTA shall pay Consultant an amount equal to (but not in addition to) the Stipend.

(D) Discretionary Stipend Payment Upon Procurement Cancellation. Notwithstanding anything to the contrary set forth in this Section, if the MBTA cancels the procurement of the Project for any reason prior to the Proposal Submittal Date, the MBTA may, in its sole discretion, elect to make a payment to Consultant for its Proposal Work Product completed as of the date of cancellation if, at the MBTA's request, Consultant: (1) submits to the MBTA all Proposal Work Product completed prior to procurement cancellation; (2) submits to the MBTA an invoice and satisfactory evidence substantiating its costs; and (3) attends a meeting with the MBTA to discuss the Proposal Work Product completed prior to procurement cancellation. In no event would any such payment be greater than the Stipend.

SECTION 6. RESPONSIVE PROPOSAL. Consultant shall not be entitled to any Stipend or other payment under this Agreement unless Consultant has provided the Proposal Work Product through and including submittal of a Proposal that, in the sole and absolute judgment of the MBTA, is a responsive Proposal determined under the criteria of the RFP and this Agreement. Without limiting any of the foregoing, the parties further acknowledge that any of the following will result in a Proposal being deemed unresponsive: (1) failure of the Technical Proposal to be received at the required submittal location at or prior to the due date and time specified in the RFP, as such due date and time may be amended by addenda to the RFP (such due date and time being the "**Technical Proposal Submittal Date**"); (2) failure of the Proposal to comply with Section 5.1 of the RFP; or (3) withdrawal of Consultant from the Project procurement process or disqualification of Consultant by the MBTA in accordance with the terms of the RFP.

SECTION 7. PAYMENT OF STIPEND.

(A) Payment of Stipend by MBTA. The Stipend shall be wired to the Consultant within 60 days of the date that the Selected Proposer is announced or the procurement is cancelled, as applicable, and following a determination by the MBTA that a Stipend is due pursuant to Section 5 of this Agreement. Consultant acknowledges and agrees that it shall be deemed to have accepted the Stipend hereunder, and that all of its rights in the Proposal Work Product are transferred to the MBTA, effective as of the date the MBTA wires the Stipend to Consultant in accordance with this Agreement. Consultant shall submit, with this signed Agreement, wire transfer instructions in the manner set forth in Appendix B.

(B) Limitations to Payment of Stipend. Consultant shall not be entitled to payment of any Stipend under this Agreement if Consultant: (1) fails to submit a Technical Proposal on or before the Technical Proposal Submittal Date; (2) files or has filed a protest of the Project procurement process, award or cancellation of the Project procurement; (3) fails to submit an invoice (or a revised invoice, if required) in accordance with this Section, or fails to provide satisfactory evidence substantiating its costs in accordance with subsection (B) of this

Section; (4) is determined by the MBTA to be the Selected Proposer and fails to engage in good faith negotiations of the Project Agreement with the MBTA; or (5) fails to comply with all other terms and conditions of this Agreement.

(C) Recordkeeping. Consultant shall maintain written records substantiating all Proposal costs incurred by Consultant and its subcontractors in producing the Proposal Work Product in sufficient detail to permit a proper audit thereof. Such records shall be made available upon request of the MBTA at all times during the term of this Agreement and for six years after final payment of a Stipend is made. For purposes of this Agreement, Proposal costs shall comprise all reasonable costs and expenses incurred by Consultant in the production of the Proposal Work Product, provided that travel expenses, and costs of production of the Proposal and other marketing-type costs and expenses, and costs of secretarial or word processing time, shall be excluded.

SECTION 8. MBTA PROPERTY. In consideration for payment of a Stipend hereunder, the MBTA may use the ideas or information contained in Consultant's Proposal and any other related Proposal Work Product in connection with any contract awarded for the Project, or in connection with any subsequent procurement, without any obligation to pay any additional compensation to Consultant, provided that such ideas or information are generally known or generally observable concepts in the transit, fare collection and payment processing industries. In addition, the MBTA may use any ideas or information set forth in the submittals listed in Appendix C to this Agreement. Upon the wiring of payment of a Stipend, the Proposal and any other Proposal Work Product shall become property of the MBTA, subject to the restrictions set forth herein, and the MBTA shall have the right to use such Proposal and related Proposal Work Product for the governmental purposes of the MBTA in any manner or combination it so elects, without notice to or consent of Consultant. The MBTA agrees that any use of such Proposal and related Proposal Work Product by the MBTA without Consultant's verification or adaptation for the specific purpose intended shall be at the MBTA's sole risk.

SECTION 9. INTELLECTUAL PROPERTY RIGHTS. The Consultant shall grant to the MBTA all intellectual property rights necessary to comply with Section 8.

SECTION 10. WAIVER OF CLAIMS. Acceptance by Consultant of payment of a Stipend from the MBTA shall fully and forever constitute a waiver by Consultant of any and all rights, equitable or otherwise, to bring any claim (including, without limitation, any protest of the Project procurement process, award or cancellation of the Project procurement) against the MBTA or any of its Board members, officers, directors, agents, employees, representatives or advisors and their successors and assigns, in connection with the procurement of the Project.

SECTION 11. TAXES. Consultant shall be responsible for payment of all taxes including federal, state and local taxes arising out of Consultant's activities in accordance with this Agreement, including by way of illustration but not limitation, federal and state income tax, social security tax, unemployment insurance tax and any other taxes or business license fees as required by applicable law.

SECTION 12. APPLICABLE LAW. Consultant shall comply with all federal, state and local laws, ordinances, rules and regulations applicable to the work or Proposal Work

Product, and shall not discriminate against any employee or applicant for employment because of race, color, religion, creed, gender, national origin, age, disability, sexual orientation, genetic status, gender identity or veteran status.

SECTION 13. CONSULTANT LIABILITY. Consultant shall be responsible for all damage to life and property due to acts, errors or omissions of Consultant or its subcontractors, agents or employees in the performance of work hereunder. Further, it is expressly understood that Consultant shall indemnify and hold harmless the MBTA from claims, suits, actions, damages and costs of every name and description resulting from the performance of work hereunder, and such indemnity shall not be limited by reasons of enumeration of any insurance coverage herein required. Consultant's obligations under this Section shall apply to and include, without limitation, claims founded upon tort; claims based upon Consultant's failure to meet professional standards; or claims based upon breach of copyright, trade secrets or other protected materials. Nothing in this Agreement shall create or give to third parties any claim or right of action against Consultant or the MBTA beyond such as may legally exist irrespective of this Agreement.

SECTION 14. TERMINATION. At any time prior to the stated original or any revised Proposal Submittal Date, the MBTA shall have the right, in its sole and absolute discretion, to terminate this Agreement, with no liability to the MBTA, by delivery to Consultant of written notice that the MBTA has determined to withdraw the RFP and cancel the procurement for the Project undertaken through the issuance of the RFP. Any such withdrawal and termination shall be without prejudice to the right of the MBTA to conduct a procurement for the Project under another procurement process commenced following the withdrawal of the RFP.

SECTION 15. CONSULTANT'S REPRESENTATIONS AND WARRANTIES. Consultant represents and warrants that the following statements are true:

(A) Due Authorization and Binding Obligation. This Agreement has been duly authorized, executed and delivered by all necessary corporate action of Consultant and constitutes a legal, valid and binding obligation of Consultant, enforceable against Consultant in accordance with its terms, except to the extent that its enforceability may be limited by the Bankruptcy Code or by equitable principles of general application.

(B) No Conflict. To the best of its knowledge after due inquiry, neither the execution nor delivery by Consultant of this Agreement nor the performance by Consultant of its obligations in connection with the transactions contemplated hereby nor the fulfillment by Consultant of the terms or conditions hereof (1) conflicts with, violates or results in a breach of any constitution, law, governmental regulation, by-laws or certificates of incorporation applicable to Consultant or (2) conflicts with, violates or results in a breach of any order, judgment or decree, or any contract, agreement or instrument to which Consultant is a party or by which Consultant or any of its properties or assets are bound, or constitutes a default under any of the foregoing.

(C) No Approvals Required. No approval, authorization, order or consent of, or declaration, registration or filing with, any governmental body is required for the valid

execution and delivery of this Agreement by Consultant except as such have been duly obtained or made.

(D) No Litigation. Except as disclosed in writing to the MBTA, there is no legal proceeding, at law or in equity, before or by any court, arbitral tribunal or other governmental body pending or, to the best of Consultant's knowledge after due inquiry, overtly threatened or publicly announced against Consultant, in which an unfavorable decision, ruling or finding could reasonably be expected to have a material and adverse effect on the execution and delivery of this Agreement by Consultant or the validity, legality or enforceability of this Agreement against Consultant, or any other agreement or instrument entered into by Consultant in connection with the transactions contemplated hereby, or on the ability of Consultant to perform its obligations hereunder or under any such other agreement or instrument.

(E) Representations and Warranties to Remain True. During the term of this Agreement, Consultant will not take any action, or omit to perform any act, that results in a representation and warranty becoming untrue. Consultant will promptly notify the MBTA if any representation and warranty becomes untrue. From time to time, Consultant will provide the MBTA, upon the MBTA's request, with proof of the continuing accuracy of these representations and warranties.

SECTION 16. ASSIGNMENT. Consultant shall not assign, transfer, pledge, sell or otherwise convey this Agreement without the MBTA's prior written consent, in its sole discretion. Any assignment of this Agreement shall be null and void and may, in the MBTA's sole discretion, disqualify Consultant from further consideration for the procurement and Project.

SECTION 17. VENUE. Any legal proceedings related to this Agreement or to any rights or any relationship between the parties arising therefrom shall be solely and exclusively initiated and maintained in Commonwealth or federal courts located in Boston, Massachusetts.

SECTION 18. CONSULTANT'S REPRESENTATIVE. The Consultant shall designate in writing to the MBTA one individual, satisfactory to the MBTA, who shall be responsible for coordinating all of the services to be rendered by the Consultant in regard to this Agreement and who shall be the MBTA's normal point of contact with the Consultant on matters relating to such services. Such individual shall be replaced upon the MBTA's written request.

SECTION 19. MBTA'S REPRESENTATIVE. The MBTA shall designate to the Consultant an individual who will serve as the MBTA's Representative and normal point of contact for the Consultant in regard to this Agreement and the Consultant's services and obligations hereunder. The MBTA may from time to time change this designation.

SECTION 20. CONFIDENTIALITY. Consultant hereby agrees that all data, recommendations, reports and other materials developed in the course of performance under this Agreement are strictly confidential between Consultant and the MBTA and Consultant may not at any time reveal or disclose such data, recommendations or reports in whole or in part to any third party without first obtaining permission from the MBTA. Notwithstanding the preceding sentence, Consultant shall cooperate fully with such third parties as the MBTA may designate by

written request. Such cooperation shall include making available to such parties, data, information and reports used or developed by Consultant in connection with performance under this Agreement.

SECTION 21. RELEASE. Simultaneously with the delivery of this Agreement, Consultant shall execute and deliver to the MBTA an instrument fully and forever releasing the MBTA from any and all claims, demands and liabilities whatsoever of every kind of nature both at law and in equity arising from, growing out of, or in any way connected with this Agreement. A copy of such release is annexed hereto as Appendix A and made a part hereof.

SECTION 22. SEVERABILITY. Each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Agreement is held to be invalid, unenforceable or illegal to any extent, such provision shall be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Agreement, unless such continued effectiveness as modified would be contrary to the basic understandings and intentions of the parties as expressed herein. If any provision of this Agreement is held to be invalid, unenforceable or illegal, the parties will promptly endeavor in good faith to negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Agreement as nearly as possible to its original intent and effect.

SECTION 23. NO WAIVER. No failure by the MBTA to insist upon the strict performance of any term or condition of this Agreement or to exercise any right or remedy consequent upon a breach thereof, and no acceptance of full or partial performance during the continuance of any such breach, shall constitute a waiver of any such breach or such term or condition. No term or condition of this Agreement to be performed or complied with by Consultant, and no breach thereof, shall be waived, altered or modified except by a written instrument executed by the MBTA. No waiver of any breach shall affect or alter this Agreement, but each and every term and condition of this Agreement shall continue in full force and effect with respect to any other then existing or subsequent breach thereof.

SECTION 24. FURTHER ASSURANCES. The MBTA and Consultant each agree to execute and deliver such further instruments and to perform any acts that may be necessary or reasonably requested in order to give full effect to this Agreement.

SECTION 25. COUNTERPARTS. This Agreement may be executed in any number of original counterparts. All such counterparts shall constitute but one and the same Agreement.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives as of the day and year first above written.

MASSACHUSETTS BAY
TRANSPORTATION AUTHORITY

[NAME OF CONSULTANT]

By: _____

By: _____

Printed Name:

Printed Name:

Title: _____

Title: _____

Date: _____

Date: _____

APPENDIX A

RELEASE

KNOW ALL MEN BY THESE PRESENTS, that the undersigned hereby acknowledges that pursuant to an agreement dated the day of _____, 2017 (the "Agreement"), pursuant to which the undersigned agreed to furnish to the Massachusetts Bay Transportation Authority (the "MBTA") all of the work relating to the Agreement, and that the MBTA has paid or will pay the undersigned, or a person, firm or corporation claiming by or through the undersigned, the sum of: \$500,000 Dollars, subject to the terms, covenants and conditions of the Agreement, said amount being the full and entire sum due from the MBTA to the undersigned pursuant to the Agreement by reason of work, labor or materials furnished or performed by the undersigned, in connection with the Agreement. In consideration of such payment, the undersigned hereby releases and discharges the MBTA, its officers, agents, and employees, of and from all claims of liability for any payment, fee or expenses payable to the undersigned pursuant to the Agreement.

The undersigned further acknowledges that neither the aforesaid payment nor acceptance by the MBTA of the work covered by the Agreement, shall in any way or manner operate as or constitute a release or waiver of the undersigned's obligations, undertakings or liabilities under the Agreement or in any way affect or limit the same.

IN WITNESS WHEREOF, the undersigned has caused its name to be hereunto subscribed and its seal to be hereunto affixed this __day of _____, 2017.

Name of Consultant

(Corporate Seal)

By: _____

APPENDIX B

WIRE TRANSFER INSTRUCTIONS

Proposer Name: _____

Proposer DBA (if applicable): _____

Address for Purchase order:

Address 1: _____

Address 2: _____

City: _____

State: _____

Zip code: _____

Address for Payment:

Address 1: _____

Address 2: _____

City: _____

State: _____

Zip code: _____

Contact Person: _____

Phone #: _____

Email: _____

Fax #: _____

Federal Tax ID #: _____

To be completed by ODCR:

SDO Ethnicity Code: _____

ODCR Signature: _____

New ACH Information:

Bank Name: _____

Bank Routing #: _____

Bank Account #: _____

Email address to which ACH advice should be sent: _____

APPENDIX C

MBTA OWNERSHIP OF PROPOSAL SUBMITTALS

- 1) Materials received in response to the Proposal Submittal Requirements set forth in Appendix 2.10 of Schedule C to the RFP
- 2) Materials received in response to the Proposal Submittal Requirements set forth in Appendix 2.13 of Schedule C to the RFP
- 3) Materials received in response to the Proposal Submittal Requirements set forth in Appendix 2.3 of Schedule C to the RFP relating to the Hands Free Gate Whitepaper
- 4) Materials received in response to the Proposal Submittal Requirements set forth in Appendix 2.9 of Schedule C to the RFP relating to General Approaches
- 5) Materials received in response to the Proposal Submittal Requirements set forth in Appendix 2.12 of Schedule C to the RFP relating to General Approaches and Installation Phasing

PROPOSAL FORM 20

FORM OF EARLY WORKS AGREEMENT

THIS AGREEMENT is made as of the ■ day of ■, ■.

BETWEEN:

THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

(the “**MBTA**”)

AND:

■

(the “**Implementation Contractor**”)

RECITALS:

- A. Pursuant to RFP No. 88-16 issued November 15, 2016 (as amended, the “**RFP**”), ■ has been selected as the Selected Proposer (as defined in the RFP) to enter into a project agreement with the MBTA to design, implement, install, integrate, test, finance, operate, maintain and manage a new automated, account-based open fare collections system for the MBTA (the “**Project**”) substantially in the form of the draft project agreement issued by final addendum to the RFP on ■ (the “**Project Agreement**”).
- B. The Implementation Contractor was identified in the Selected Proposer’s Proposal as the Lead Design and Installation Firm (as defined in the RFP).
- C. The Implementation Contractor has agreed to proceed with the Implementation Work in advance of Commercial Close and Financial Close, subject to and upon the conditions set out in this Early Works Agreement.

NOW THEREFORE in consideration of the MBTA permitting the Early Works to be carried out, and in consideration of the MBTA agreeing, subject to and in accordance with Section 10, to make payment to the Implementation Contractor in relation to the Early Works hereunder in the event that this Early Works Agreement is terminated prior to the achievement of Financial Close under the Project Agreement, the Implementation Contractor agrees to proceed with the Early Works subject to and upon the conditions set out in this Early Works Agreement.

1. Definitions

- (a) “**Applicable Law**” has the meaning given in the Project Agreement.
- (b) “**Bankruptcy Related Event**” has the meaning given in the Project Agreement.

- (c) “**Business Day**” has the meaning given in the Project Agreement.
- (d) “**Change**” has the meaning given in the Project Agreement.
- (e) “**Commercial Close**” means the date established as the Effective Date under the Project Agreement.
- (f) “**Contract Price**” means an amount not to exceed \$8,500,000, which includes the Cost-Certain Specifications Price and amounts payable for any other Early Works performed under this Early Works Agreement.
- (g) “**Cost-Certain Specifications Price**” means the portion of the Contract Price which is payable upon completion of the Cost-Certain Specifications, which amount shall not exceed \$4,000,000.
- (h) “**Early Works**” means the Implementation Work which is permitted under the Project Agreement to be performed by the Systems Integrator prior to the Financial Close Date and any Implementation Work which is required under this Early Works Agreement.
- (i) “**Financial Close Date**” has the meaning given in the Project Agreement.
- (j) “**Financial Close Deadline**” has the meaning given in the Project Agreement.
- (k) “**Governmental Authority**” has the meaning given in the Project Agreement.
- (l) “**Implementation Contractor**” means [____], a [____] organized and existing under the laws of [____], and its permitted successors and assigns.
- (m) “**Implementation Contractor’s Claim**” has the meaning given in Section 11(c).
- (n) “**Implementation Work**” has the meaning given in the Project Agreement.
- (o) “**Locations**” has the meaning given in the Project Agreement.
- (p) “**MBTA**” means the Massachusetts Bay Transportation Authority, a body politic and corporate and a political subdivision of the Commonwealth, established under the provisions of M.G.L. c. 161A et seq.
- (q) “**MBTA Person**” has the meaning given in the Project Agreement.
- (r) “**MBTA Representative**” means [____] or such other person designated by the MBTA and notified in writing to the Implementation Contractor.
- (s) “**Party**” means the MBTA or the Implementation Contractor, and “**Parties**” means the MBTA and the Implementation Contractor.
- (t) “**Project Agreement**” has the meaning set out in Recital A to this Agreement.

- (u) **“Vehicles”** has the meaning given in the Project Agreement.

Capitalized terms not otherwise defined in this Early Works Agreement shall have the meaning set forth in the Project Agreement.

2. Interpretation

This Early Works Agreement shall be interpreted according to the following provisions, unless the context requires a different meaning:

- (a) The headings in this Early Works Agreement are for convenience of reference only, shall not constitute a part of this Early Works Agreement, and shall not be taken into consideration in the interpretation of, or affect the meaning of, this Early Works Agreement.
- (b) Unless the context otherwise requires, references to specific Sections, Paragraphs, Subparagraphs, and other divisions are references to such Sections, Paragraphs, Subparagraphs, or divisions of this Early Works Agreement and the terms “Section” and “Clause” are used interchangeably and are synonymous.
- (c) Words importing persons include individuals, legal personal representatives, firms, companies, associations, joint ventures, general partnerships, limited partnerships, limited liability partnerships, limited liability companies, trusts, business trusts, corporations, governmental bodies, and other legal entities.
- (d) Unless the context otherwise requires, wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neuter genders include all other genders.
- (e) References to any standard, principle, agreement or document include (subject to all relevant approvals and any other provisions of this Early Works Agreement concerning amendments) a reference to that standard, principle, agreement or document as amended, supplemented, restated, substituted, replaced, novated or assigned.
- (f) The words not otherwise defined in this Early Works Agreement shall bear their natural meaning.
- (g) References containing terms such as:
 - (i) “hereof”, “herein”, “hereto”, “hereinafter”, “hereby” and other terms of like import are not limited in applicability to the specific provision within which such references are set forth but instead refer to this Early Works Agreement taken as a whole; and

- (ii) “include”, “includes” and including” are to be construed as meaning “include without limitation”, “includes without limitation” and “including without limitation”, respectively.
- (h) Where this Early Works Agreement states that an obligation shall be performed “no later than” or “within” or “by” a stipulated date or event which is a prescribed number of days after a stipulated date or event, the latest time for performance shall be 5:00 p.m. local time on the last day for performance of the obligation concerned, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
- (i) Where this Early Works Agreement states that an obligation shall be performed “on” a stipulated date, the latest time for performance shall be 5:00 p.m. local time on that day, or, if that day is not a Business Day, 5:00 p.m. on the next Business Day.
- (j) Unless otherwise specified in this Early Works Agreement, any reference to time of day or date means the local time or date in Boston, Massachusetts.
- (k) Unless otherwise indicated, time periods will be strictly construed.
- (l) The expression "all reasonable efforts" and expressions of like import, when used in connection with an obligation of either Party, means taking in good faith and with due diligence all commercially reasonable steps to achieve the objective and to perform the obligation, including doing all that can reasonably be done in the circumstances taking into account each Party's obligations hereunder to mitigate delays and additional costs to the other Party, and in any event taking no less steps and efforts than those that would be taken by a commercially reasonable and prudent person in comparable circumstances but where the whole of the benefit of the obligation and where all the results of taking such steps and efforts accrued solely to that person's own benefit; provided that, the foregoing will not require the MBTA to:
 - (1) Take any action which is contrary to the public interest, as determined by the MBTA in its discretion; or
 - (2) Undertake action that might be available to the MBTA due to its status as a Governmental Body but that would not be available to a private, commercially reasonable and prudent person.
- (m) Whenever the terms “will” or “shall” are used in this Early Works Agreement they shall be construed and interpreted as synonymous and to read “shall”.
- (n) Unless otherwise notified in writing, the Implementation Contractor shall be entitled to treat any act of the MBTA Representative which is authorized by this Early Works Agreement as being authorized by the MBTA, and the Implementation Contractor shall not be required to determine whether authority has in fact been given.

3. Performance of the Early Works

- (a) Unless and until the termination of the Early Works Agreement, the Implementation Contractor shall perform the Early Works in accordance with the requirements set forth in the Project Agreement relating to the Implementation Work.
- (b) As part of the Early Works, the Implementation Contractor shall prepare the Cost-Certain Specifications in accordance with the requirements set forth in Appendix 2.13 to the Project Agreement and Section 6.5 of the Project Agreement; a Project Schedule, Project Management Plan, Project status dashboard and Submittal tracking tool which satisfy the requirements set forth in Appendix 2.11 to the Project Agreement; and a Submittal schedule and template for Design Review feedback which satisfy the requirements set forth in Appendix 7 to the Project Agreement.
- (c) The Implementation Contractor shall not, as part of the Early Works, perform any Implementation Work on any AFC 1.0 Gates.
- (d) The Implementation Contractor may, as part of the Early Works, place orders for, or manufacture, Devices; provided that the quantities requested in such orders shall be limited to the quantities required for the Model Office. The Implementation Contractor shall not place orders for, or manufacture, any Devices the Implementation Contractor intends to install at any Location, any SI Location or on any Vehicle.
- (e) Except as provided in Section 3(b), Section 3(c) and Section 3(d), the Implementation Contractor may perform, as part of the Early Works, any Implementation Work required by the Project Agreement that it deems necessary and that is permitted prior to the Financial Close Date pursuant to the Project Agreement.

4. Access to Locations and Vehicles

The MBTA hereby grants to the Implementation Contractor access to those Locations and Vehicles as are reasonably required to carry out the Early Works in accordance with this Early Works Agreement. The access granted shall be subject to the requirements and restrictions pertaining to the Locations and Vehicles set out in the Project Agreement. The Implementation Contractor shall not perform any site preparation, demolition, or other similar physical removal or installation work at any Location or on any Vehicle under this Early Works Agreement.

5. Project Agreement

The Project Agreement shall supersede and replace this Early Works Agreement beginning on the Financial Close Date. Without prejudice to the generality of the foregoing, any part of the Early Works performed by the Implementation Contractor under and in accordance with this Early Works Agreement shall be treated as having been performed under and in accordance with the Project Agreement, any goods or materials produced under this Early Works Agreement shall constitute Deliverables under the Project Agreement, and the MBTA's payment obligations related to that part of the Early Works will be those under the Project Agreement and not under this Early Works Agreement.

6. Certain Limitations on Liability

- (a) Save as to any payments which may become due pursuant to and in accordance with Section 10 and Section 11, the MBTA shall have no liability to the Implementation Contractor whatsoever, whensoever and howsoever arising out of or in connection with the Early Works or the conditions of this Early Works Agreement.
- (b) No approval, instruction or comment by the MBTA or by the MBTA Representative in connection with the Early Works shall discharge, release or diminish any obligation and/or liability of the Implementation Contractor under this Early Works Agreement or give rise to any liability to the Implementation Contractor on the part of the MBTA.
- (c) In the event this Early Works Agreement is terminated prior to the completion of the Cost-Certain Specifications, the Implementation Contractor shall have no liability to the MBTA whatsoever, whensoever, and howsoever arising out of or in connection with the MBTA's use of the uncompleted Cost-Certain Specifications.

7. Implementation Contractor to Perform at Own Cost

Without prejudice to the generality of Section **Error! Reference source not found.**, the Implementation Contractor shall perform the Early Works entirely at its own cost (save as to any payments which may become due from the MBTA to the Implementation Contractor pursuant to and in accordance with Section 10 and Section 11) and risk, and any consequences of such performance (or any failure in or of such performance) for the manner and timing of the performance of the Early Works shall be entirely at the cost and risk of the Implementation Contractor. For the avoidance of doubt, other than to the extent that compensation becomes due pursuant to Section 10, the Implementation Contractor shall be responsible for any and all costs it incurs as a result of funding the Early Works.

8. Insurance

The Implementation Contractor has taken out the insurance policies described in Appendix A hereto in the amounts and on the terms stated in Appendix A and shall deliver to the MBTA the certificates of insurance pertaining to said insurance policies no later than 10 Business Days following the MBTA's countersigning of this Early Works Agreement and as a condition precedent to any access rights granted under this Early Works Agreement. The Implementation Contractor shall maintain said insurance policies in good standing throughout the term of this Early Works Agreement.

9. Termination of Early Works Agreement

- (a) This Early Works Agreement shall terminate upon the earlier of:
 - (i) The Financial Close Date; and
 - (ii) The Financial Close Deadline.

- (b) The MBTA reserves the right (at any time and for any reason) to terminate this Early Works Agreement forthwith by service of written notice to this effect upon the Implementation Contractor.
- (c) In the event that the Implementation Contractor:
 - (i) is in material breach of its obligations, duties or responsibilities under this Early Works Agreement; or
 - (ii) wholly abandons the Early Works for a period which exceeds three Business Days from receipt by the Implementation Contractor of a written notice thereof,

the MBTA Representative shall give to the Implementation Contractor a written notice specifying the breach. If the Implementation Contractor does not rectify the specified breach within 30 days of receipt of such notice then the MBTA Representative may serve a further written notice on the Implementation Contractor terminating this Early Works Agreement with immediate effect.

- (d) In the event that a Bankruptcy Related Event occurs in respect of the Implementation Contractor, the MBTA may, at any time, terminate this Early Works Agreement by written notice to the Implementation Contractor having immediate effect.

10. Compensation on Termination

- (a) In the event that this Early Works Agreement is terminated under Section 9(a)(ii), the MBTA shall, subject to Section 10(d) and Section 11, pay to the Implementation Contractor the aggregate of:
 - (i) the amount(s) due, based on the relevant values in Appendix B, for any Early Works which have been completed prior to the date of termination;
 - (ii) in respect of those Early Works which have not been completed at the date of termination of this Early Works Agreement, the value of work undertaken as at the date of termination in respect of such Early Works, calculated and organized based on the values set forth in Appendix B, with all appropriate third party invoices and supporting documentation substantiating costs, provided that any Early Works which do not have relevant Unit Rates are itemized on and substantiated by such invoices;
 - (iii) any sub-contractor or order cancellation charges which are reasonably and properly incurred by the Implementation Contractor; and
 - (iv) the cost of materials and goods reasonably and properly ordered for the Early Works for which the Implementation Contractor has paid or for which the Implementation Contractor is legally bound to pay (provided that upon such

payment in full by the MBTA, such goods and materials shall become the property of the MBTA);

provided that there shall be no double counting between any of the foregoing and nothing in this Early Works Agreement shall require the MBTA to pay for any Early Works that are not in compliance with the terms of this Early Works Agreement.

- (b) In the event that this Early Works Agreement is terminated under Section 9(b), the MBTA shall, subject to Section 10(d), pay to the Implementation Contractor the aggregate of:
 - (i) the amounts referred to in Section 10(a); and
 - (ii) any demobilization costs reasonably and properly incurred by the Implementation Contractor,

provided there shall be no double counting between Sections 10(b)(i) to 10(b)(ii).

- (c) In the event that this Early Works Agreement is terminated under Sections 9(c) or 9(d), the MBTA shall, subject to Section 10(d), pay to the Implementation Contractor the aggregate of the amounts referred to in Section 10(a) less the aggregate of the amount of any costs reasonably and properly incurred (or to be incurred) by:
 - (i) the MBTA in completing the Early Works; and
 - (ii) subject to Section 13, any losses caused to the MBTA as a result of the termination,

provided that, in the event that such calculation results in a negative amount, the Implementation Contractor shall pay such amount to the MBTA.

- (d) The MBTA's maximum financial commitment under this Early Works Agreement and its total aggregate liability to make payment under Sections 10(a), 10(b) or 10(c), as the case may be, shall be limited in all circumstances to the Contract Price, and the MBTA shall have no liability to make any payment to the Implementation Contractor in excess of the Contract Price, regardless of how any further sums are calculated or constituted.
- (e) The MBTA's financial commitment under this Early Works Agreement with respect to individual units of equipment, labor, goods and materials shall not exceed the individual applicable Unit Rates set forth in Appendix B hereto and shall be subject to Appendix 11 to the Project Agreement.
- (f) The obligations under this Early Works Agreement with respect to the review of Submittals relating to the Early Works shall be subject to Appendix 7 to the Project Agreement.

11. Payment of Termination Amount

- (a) In no event shall the Implementation Contractor be paid the Cost-Certain Specifications Price if the Implementation Contractor has not completed the Cost-Certain Specifications, except to the extent that the Implementation Contractor has not completed the Cost-Certain Specifications due to a termination of this Early Works Agreement (other than a termination pursuant to Section 9(c) or 9(d)) by the MBTA prior to the Financial Close Date.
- (b) Either party may set off against any amount due from such party any amount due from the other party under or for breach of the terms of this Early Works Agreement.
- (c) Within five Business Days of the date of termination of the performance of the Early Works, the Implementation Contractor shall provide to the MBTA Representative full details of the amounts which it believes to be due to the Implementation Contractor pursuant to Section 10 and the basis for their calculation, together with such supporting documentation as may be necessary to verify such amounts (the “**Implementation Contractor’s Claim**”).
- (d) Within five Business Days of receipt of such the Implementation Contractor’s Claim, the MBTA Representative may request that the Implementation Contractor provide such further details and supporting documentation as it may reasonably require to verify the amount due to the Implementation Contractor pursuant to Section 10.
- (e) The amounts due to the Implementation Contractor pursuant to Section 10, and the basis for their calculation, shall be notified to the Implementation Contractor by the MBTA Representative within five Business Days of receipt of such further details and supporting documentation or (if no such details have been requested by the MBTA Representative) within five Business Days of receipt of the Implementation Contractor’s Claim, and the Implementation Contractor shall then submit to the MBTA Representative a full invoice for such amounts.
- (f) Within 30 Business Days following receipt of such invoice, the MBTA will pay such amounts to the Implementation Contractor.

12. Post-Termination Transition

- (a) Upon termination of the Early Works pursuant to Section 9 (other than pursuant to Section 9(a)(i)), the Implementation Contractor shall forthwith cease the performance of the Early Works in a proper and orderly manner and:
 - (i) within five Business Days, the Implementation Contractor shall vacate the Locations and Vehicles and remove therefrom in a proper and orderly manner all materials used in or arising out of the Early Works, and shall leave the Locations and Vehicles in a clean, tidy and safe condition; and

- (ii) transfer to the MBTA ownership of all complete and incomplete work and goods and materials comprised in the Early Works (including all intellectual property produced specifically for the MBTA for this Project and any other intellectual property rights which the MBTA may reasonably require in order to use any complete or incomplete work and goods and materials, but excluding all other intellectual property) shall pass to the MBTA.

13. No Consequential Damages

In no event shall either Party be liable to the other or obligated in any manner to pay to the other Party any special, incidental, consequential, punitive or similar losses or damages (including loss of profits, loss of production, loss of business opportunity or other consequential or indirect loss) based upon claims arising out of or in connection with the performance or non-performance of its obligations or otherwise under this Early Works Agreement, whether such claims are based upon contract, tort, negligence, warranty or any other legal theory; provided that, such limitation on each Party's liability shall not apply to or limit recovery in respect of either Party's liability for losses or damages arising out of fraud, willful misconduct, criminal conduct or bad faith on the part of the other Party.

14. Progress Report

Once the costs incurred by the Implementation Contractor under this Early Works Agreement exceed \$3,000,000, the Implementation Contractor shall deliver to the MBTA a progress report summarizing the Early Works performed to date and their costs, including any appropriate documentation evidencing such costs. Within five Business Days, the MBTA shall, upon a review of the Early Works performed to date and the costs incurred, and without limiting the rights under Section 9, deliver to the Implementation Contractor a written notice to continue performance of the Early Works. Unless and until the MBTA delivers a written notice to the Implementation Contractor to continue performance of the Early Works, the MBTA shall not be obligated to pay the Implementation Contractor for costs incurred by the Implementation Contractor under this Early Works Agreement which exceed \$3,000,000. If the MBTA does not deliver any notice within five Business Days, such notice to continue performance shall be deemed to have been given.

15. Notices

All notices, requests, demands, instructions, certificates, consents and other communications (each being a "Notice") required or permitted under this Early Works Agreement shall be in writing (whether or not "written notice" or "notice in writing" is specifically required by the applicable provision of this Early Works Agreement) and served by sending the same by registered mail or by hand or transmitted by electronic transmission to the address or electronic mail address as follows:

If to the Implementation Contractor: ■

If to the MBTA: ■

16. Electronic Transmission

Where any Notice is provided or submitted to a Party via electronic transmission, an original of the Notice sent via electronic transmission shall promptly be sent by regular mail or registered mail. For greater certainty, a Notice given via electronic transmission shall not be invalid by reason only of a Party's failure to comply with this Section 16.

17. Change of Address

Either Party to this Early Works Agreement may, from time to time, change any of its contact information set forth in Section 13 by prior Notice to the other Party, and such change shall be effective on the Business Day that next follows the recipient Party's receipt of such Notice unless a later effective date is given in such Notice.

18. Deemed Receipt of Notices

- (a) Subject to Sections 18(b) and 18(c):
- (i) a Notice given by registered mail shall be deemed to have been received on the third Business Day after mailing;
 - (ii) a Notice given by hand delivery shall be deemed to have been received on the day it is delivered; and
 - (iii) a Notice given by electronic transmission shall be deemed to have been received on the day it is transmitted by electronic transmission.
- (b) If the Party giving the Notice knows or ought reasonably to know of difficulties with the postal system which might affect negatively the delivery of mail, any such Notice shall not be mailed but shall be made or given by personal delivery or by electronic transmission in accordance with Section 17.
- (c) If any Notice delivered by hand or transmitted by electronic transmission is so delivered or transmitted, as the case may be, either on a day that is not a Business Day or on a Business Day after 4:00 p.m. (recipient's local time), then such Notice shall be deemed to have been received by such recipient on the next Business Day.

19. Amendments

This Early Works Agreement may not be varied, amended or supplemented except by an agreement in writing signed by duly authorized representatives of the Parties and stating on its face that it is intended to be an amendment, restatement or other modification, as the case may be, to this Early Works Agreement.

20. Waiver

- (a) No waiver made or given by a Party under or in connection with this Early Works Agreement shall be binding or effective unless the waiver is in writing, signed by an authorized representative of the Party giving such waiver, and delivered by such Party to the other Parties. No waiver made with respect to any right, power or remedy in one instance will be deemed to be a waiver with respect to any other instance involving the exercise of such right, power, or remedy or with respect to any other right, power, or remedy.
- (b) Failure by any Party to exercise any of its rights, powers or remedies hereunder or its delay to do so shall not constitute a waiver of those rights, powers or remedies. The single or partial exercise of a right, power or remedy shall not prevent its subsequent exercise or the exercise of any other right, power or remedy.

21. Relationship Between the Parties

The Parties are independent contractors. This Early Works Agreement is not intended to and does not create or establish between the Parties any relationship as partners, joint venturers, employer and employee, master and servant, or principal and agent.

22. Entire Agreement

- (a) Except where provided otherwise in this Early Works Agreement (including by reference to the Project Agreement), this Early Works Agreement constitutes the entire agreement between the Parties in connection with the subject matter of this Early Works Agreement and supersedes all prior representations, communications, negotiations and understandings, whether oral, written, express or implied, concerning the subject matter of this Early Works Agreement.
- (b) The MBTA is not obligated in any way by the terms of this Early Works Agreement to proceed to Commercial Close or the Financial Close Date or to proceed with the procurement of the Project.

23. Severability

Each provision of this Early Works Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Early Works Agreement is declared invalid, unenforceable or illegal by the courts of a competent jurisdiction, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Early Works Agreement. If any

such provision of this Early Works Agreement is invalid, unenforceable or illegal, the Parties shall, acting in good faith, promptly negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Early Works Agreement as near as possible to its original intent and effect.

24. No Assignment

The Implementation Contractor shall not assign or transfer all or any part of its rights obligations under this Early Works Agreement without the prior written consent of the MBTA. The MBTA may assign or otherwise dispose of the benefit of the whole or part of this Early Works Agreement to any person to whom the MBTA may assign or otherwise dispose of its interest in the Project Agreement pursuant to the Project Agreement.

25. Confidentiality

The Implementation Contractor shall comply with all the obligations incumbent upon the Systems Integrator under Section 25.8 of the Project Agreement, the provisions of which are incorporated into this Early Works Agreement, *mutatis mutandis*.

26. Remedies Cumulative

The rights and remedies under this Early Works Agreement are cumulative and are in addition to and not in substitution for any other rights and remedies available at law or in equity or otherwise. No single or partial exercise by a Party of any right or remedy precludes or otherwise affects the exercise of any other right or remedy to which that Party may be entitled.

27. Enurement

This Early Works Agreement shall enure to the benefit of, and be binding on, each of the Parties and their respective successors and permitted transferees and assigns.

28. Governing Law and Jurisdiction

This Early Works Agreement shall be governed by and construed in accordance with the applicable laws of the Commonwealth of Massachusetts.

29. Further Assurance

Each Party shall do all things, from time to time, and execute all further documents necessary to give full effect to this Early Works Agreement.

30. Proof of Authority

The MBTA reserves the right to require any person executing this Early Works Agreement on behalf of the Implementation Contractor to provide proof, in a form acceptable to

the MBTA, that such person has the requisite authority to execute this Early Works Agreement on behalf of and to bind the Implementation Contractor.

31. Counterparts

This Early Works Agreement may be executed in one or more counterparts. Any single counterpart or a set of counterparts executed, in either case, by all the Parties shall constitute a full, original and binding agreement for all purposes. Counterparts may be executed either in original or electronically transmitted form provided that any Party providing its signature in electronically transmitted form shall promptly forward to such Party an original signed copy of this Early Works Agreement which was so electronically transmitted.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF the Parties have executed this Early Works Agreement as of the date first above written.

[SIGNATURE PAGE TO BE DEVELOPED.]

APPENDIX A

INSURANCE

1.1 Required Insurance

The Implementation Contractor shall obtain and keep in force the insurance policies specified herein throughout the term of this Early Works Agreement.

1.2 Commercial General Liability Insurance

Commercial general liability insurance covering all operations by or on behalf of the Implementation Contractor on an occurrence basis against claims for bodily injury, property damage (including loss of use), personal injury and advertising injury with limits not less than \$1,000,000 per occurrence and \$2,000,000 annual aggregate. The commercial general liability policy must provide coverage for work performed under an insured contract within 50 feet of railroad tracks. This coverage must be evidenced with a certificate of insurance and a policy endorsement.

Terms and conditions for required commercial general liability insurance shall include:

- ISO Commercial General Liability Policy (Occurrence Form);
- Products and completed operations coverage maintained for at least two (2) years after the Financial Close Deadline;
- Blanket contractual liability;
- Broad form property damage; and
- The MBTA, and each other MBTA Entity and MBTA Person shall be an additional insured on a primary non-contributory basis.

1.3 Automobile Liability Insurance

Automobile liability insurance covering the use of all vehicles: owned, leased, hired and non-owned; with limits not less than \$1,000,000 combined single limit.

1.4 Workers' Compensation Insurance and Employer's Liability Insurance

Workers' compensation insurance, including employer's liability insurance as provided by Massachusetts General Laws, Chapter 152, as amended, covering all work and services performed under this Early Works Agreement. Such insurance shall contain a waiver of any and all subrogation rights against the MBTA (and any other MBTA Entity and MBTA Person). Workers' compensation coverage shall be provided in accordance with statutory limits. Employer's liability coverage shall be provided with the following minimum limits:

- \$1,000,000 each accident for bodily injury by accident;
- \$1,000,000 each employee for bodily injury by disease; and
- \$1,000,000 aggregate policy limit for bodily injury disease.

1.5 Technology Errors & Omissions/Professional Liability Insurance

Technology errors & omissions/professional liability insurance, in an amount not less than \$25,000,000 per claim and annual aggregate (except as otherwise provide in this Section 1.5 in the event a Project-specific policy is obtained and maintained by the Implementation Contractor), covering (a) all acts, errors, omissions, negligence, infringement of Intellectual Property (except patent and trade secrets); (b) network security and privacy risks, including unauthorized access, failure of security, breach of privacy perils, wrongful disclosure, collection, or other negligence in the handling of confidential information, privacy perils, and including coverage for related regulatory defense and penalties; and (c) data breach expenses, in an amount not less than \$10,000,000, including consumer notification, whether or not required by Applicable Law, computer forensic investigations, public relations and crisis management firm fees, credit file or identity monitoring or remediation services in the performance of services for the MBTA or on behalf of the MBTA hereunder. If a sub-limit applies to any elements of coverage, the certificate of insurance evidencing the coverage above must specify the coverage section and the amount of the sub-limit. Such insurance shall be maintained in force at all times during the Term and for a period of four (4) years following the Financial Close Deadline, for services completed during the term of this Early Works Agreement.

The minimum per claim and annual aggregate amounts of coverage required by this Section 1.5 may be reduced to \$10,000,000 in the event the Implementation Contractor obtains and maintains the insurance coverage required by this Section 1.5 through a Project-specific policy meeting the requirements of Section 1.3 of Appendix 12 to the Project Agreement, instead of through a general corporate policy as permitted pursuant to Section 1.2 of Appendix 12 to the Project Agreement.

1.7 Bonding

No performance or surety bonds are required to be taken out in respect of the Early Works hereunder.

APPENDIX B

UNIT RATES AND CHANGE IN COST METHODOLOGY

[Selected Proposer's Pro-Forma Tables 6A and 6B to be set forth here to the extent applicable to the Implementation Contractor.]

PROPOSAL FORM 20A

COMMITMENT TO ENTER INTO EARLY WORKS AGREEMENT

(To be typed on Proposer's Letterhead)

[Date]

Re: Commitment to Enter into the Early Works Agreement for the AUTOMATED FARE COLLECTION SYSTEM Project

By signing this Proposal Form 20A, Proposer commits to entering into the Early Works Agreement with the MBTA. Proposer acknowledges that the deliverables listed herein must be provided as Early Works under the Early Works Agreement.

Appendix 2.11: [CDRL: Project Schedule]

Appendix 2.11: [CDRL: Project Management Plan]

Appendix 2.11: [CDRL: Project status dashboard]

Appendix 2.11: [CDRL: Submittal tracking tool]

Appendix 2.13: [CDRL: Cost-Certain Specifications]

Appendix 7: [CDRL: Submittal schedule]

Appendix 7: [CDRL: Template for Design Review feedback]

Signed: _____

Printed Name: _____

Title: _____

Date: _____

PROPOSAL FORM 21
REFERENCE PROJECTS

The Proposer shall nominate three of the reference projects included in the Proposer’s Proposal in response to the Proposer team experience PSRs which it would like the MBTA to consider visiting as part of the MBTA reference project site visits.

Reference project #1

| | |
|--|---|
| Location | Click here to enter text. |
| Name of transit system | Click here to enter text. |
| SI’s role in the project | Click here to enter text. |
| Duration of contract | From Click here to enter text. To Click here to enter text. |
| Comparable system elements implemented by the SI | <input type="checkbox"/> Full-Functionality FVMs <input type="checkbox"/> Limited-Functionality FVMs <input type="checkbox"/> Gates <input type="checkbox"/> Accessible Gates <input type="checkbox"/> Station Validators <input type="checkbox"/> Vehicle Validators <input type="checkbox"/> Inspection Devices <input type="checkbox"/> Mobile Fare Card <input type="checkbox"/> System Website <input type="checkbox"/> Account-based System <input type="checkbox"/> Standard Fare Card <input type="checkbox"/> Temporary Fare Card |
| Suggested stations, stops or vehicles for the field team to visit | Click here to enter text. |

Reference project #2

| | |
|---|---|
| Location | Click here to enter text. |
| Name of transit system | Click here to enter text. |
| SI’s role in the project | Click here to enter text. |
| Duration of contract | From Click here to enter text. To Click here to enter text. |
| Comparable system elements implemented by the SI | <input type="checkbox"/> Full-Functionality FVMs <input type="checkbox"/> Limited-Functionality FVMs |

| | |
|--|--|
| | <input type="checkbox"/> Gates <input type="checkbox"/> Accessible Gates <input type="checkbox"/> Station Validators <input type="checkbox"/> Vehicle Validators <input type="checkbox"/> Inspection Devices <input type="checkbox"/> Mobile Fare Card <input type="checkbox"/> System Website <input type="checkbox"/> Account-based System <input type="checkbox"/> Standard Fare Card <input type="checkbox"/> Temporary Fare Card |
| Suggested stations, stops or vehicles for the field team to visit | Click here to enter text. |

Reference project #3

| | |
|--|---|
| Location | Click here to enter text. |
| Name of transit system | Click here to enter text. |
| SI's role in the project | Click here to enter text. |
| Duration of contract | From Click here to enter text. To Click here to enter text. |
| Comparable system elements implemented by the SI | <input type="checkbox"/> Full-Functionality FVMs <input type="checkbox"/> Limited-Functionality FVMs <input type="checkbox"/> Gates <input type="checkbox"/> Accessible Gates <input type="checkbox"/> Station Validators <input type="checkbox"/> Vehicle Validators <input type="checkbox"/> Inspection Devices <input type="checkbox"/> Mobile Fare Card <input type="checkbox"/> System Website <input type="checkbox"/> Account-based System <input type="checkbox"/> Standard Fare Card <input type="checkbox"/> Temporary Fare Card |
| Suggested stations, stops or vehicles for the field team to visit | Click here to enter text. |

PROPOSAL FORM 22
EQUIPMENT PRICE CATALOGUE

Name of Proposer Team (if any): _____

Provide pricing for each Customer-Facing Device subcomponent.

| Subcomponent | 2017 Catalogue Price ¹ |
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¹ These prices will be index-linked, as indicated in Appendix 9.

Conformed through Addendum 19

SCHEDULE A
PROPOSAL SUBMITTAL REQUIREMENTS

SCHEDULE A – PROPOSAL SUBMITTAL REQUIREMENTS

1.1 General Instructions

This Schedule A describes the specific instructions for preparing the Proposals. Proposers shall submit the information required by this Schedule A in the required organization and format, and using the forms, specified herein. Failure to provide the requested information on the forms and in the form specified, or to provide all of the information requested, may result in the MBTA deeming a Proposal non-responsive. Capitalized terms used in this Schedule are directly defined in the tables below or in the respective definition and interpretation sections of this RFP and the Draft Project Agreement.

As stated in Section 4.1 of the RFP, Proposers are advised that upon award of the Draft Project Agreement, portions of the Selected Proposer's Technical Proposal and Financial Proposal will be included or incorporated into the Draft Project Agreement.

1.2 Proposal Format

1.2.1 Generally

Proposals are to be submitted in both printed copies and electronic copies. In the event of any conflict between the printed and electronic copies, the printed copy will take precedence. Proposals shall be presented in four volumes, to be sealed separately from each other, in the order set forth below

Volume 1 – General Information:

This Volume shall contain general information about the Proposal, including the completed Proposal Transmittal Form set forth as Proposal Form 1 of this RFP. Proposers shall not include any information related to price in this Volume.

Volume 2 – Technical Proposal:

This Volume shall contain the Proposer's complete technical Proposal information. Proposers shall not include any information related to price in this Volume.

Volume 3 – Financial Proposal:

This Volume shall contain the financial and commercial information.

1.2.2 Formatting Requirements for Hard Copies

Printed copies of each Proposal must adhere to the format described in Section 4.4 of the RFP.

The MBTA reserves the right to exclude pages/sections from evaluation that do not meet the formatting requirements or that are illegible.

1.2.3 Formatting Requirements for Electronic Copies

Proposers shall submit one electronic copy of their Technical Proposal with the hard copies of their Technical Proposal, and one electronic copy of their Financial Proposal with the hard copies of their Financial Proposal. In accordance with Section 3.21 of the RFP, Proposers shall also submit the electronic Public Copy of the full Proposal with their Financial Proposals.

Electronic copies of each Proposal must adhere to the following format:

MBTA
Systems Integrator Procurement

RFP No. 88-16

- a. Submitted on CDs or flash drives in both Adobe Acrobat Portable Document Format (PDF file type) and, if another format is specified the table below, in the format specified in the table below;
- b. One copy of the entire contents of the relevant Volume must be included on each CD or flash drive; and
- c. The Project name, Proposer’s name, and Volume name and number must appear on the case of each CD or flash drive, and the CD or flash drive itself.

Active Electronic File Formats

| <i>File Type</i> | <i>Software Volume</i> |
|------------------------------|---|
| Text based documents: | Microsoft Office Word |
| Spreadsheet based documents: | Microsoft Office Excel |
| Drawings & Data Files: | pdf files or other format as agreed |
| Schedules: | Microsoft Project (or in a format agreed to in the Individual Meetings) |

1.2.4 Number of Copies and Copy Identification

Proposers shall comply with the packaging instructions set forth in Section 4.2.2 of the RFP.

All packages in each Volume may be delivered in a single binder containing all of the packages in such Volume provided that the packages are tabbed or separated by divider sheets. Proposers shall not include any Volume 3 packages or Volume 4 in the binders containing Volume 1 and Volume 2.

In addition to labeling the outside of the envelope or boxes containing the binder(s) of Proposal Volumes, each binder containing a Volume shall be clearly marked with “**Copy Number X of Y**” and with the Project name, Volume number and Proposer’s name.

1.2.5 Packaging and Labelling

Proposers must submit the Volumes in sealed envelopes or boxes, addressed as set forth in Section 4.2.1 of the RFP. Each envelope or box must be clearly marked with the Proposer’s name, and “PROPOSAL FOR MBTA AFC 2.0 PROJECT.” If more than one envelope or box is delivered, each must be completely labelled and marked “**Number X of Y.**”

1.2.6 Proposal Forms

All forms named in this Schedule are provided as Proposal Forms, unless otherwise noted. All blank spaces in the Proposal Forms must be filled in, as appropriate. Proposers may make non-substantive changes to the forms (e.g. expanding the forms to properly include all required information or adding additional signature blocks to accommodate signatures from multiple Proposer Team members). No substantive changes shall be made to the Proposal Forms.

Evidence of signature authority shall be provided for all individuals signing Proposal Forms.

VOLUME 1: GENERAL INFORMATION

In Volume 1, the Proposer must provide general information about its Proposal, together with completed forms, where required. The full contents of Volume 1 will be reviewed against the Proposal Submittal Requirements during the Responsiveness Review stage of the evaluation to ensure the inclusion of all the information listed below.

| Section No. | Title | Contents |
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| Package 1 - Proposal Forms | | |
| 1-1 | Proposal Transmittal Letter (Proposal Form 1A) | <p>Submit a fully executed and notarized Proposal Form 1A (Technical Proposal Transmittal Letter).</p> <p>The Technical Proposal Transmittal Letter and all attachments thereto shall be signed by a representative of the Proposer who is empowered to sign it and to commit the Proposer to the obligations contained in the Proposal. The Technical Proposal Transmittal Letter shall include the following attachment:</p> <ul style="list-style-type: none"> (1) Attachment 1 – Certificate of Authorization (2) Attachment 2 – Statement justifying records marked as proprietary or trade secret (if applicable) |
| 1-2 | Proposer Team Members (Proposal Form 2) | <p>Proposer shall list on Proposal Form 2 (Proposer Team Member List) the names and roles of all firms currently identified as part of the Proposer Team. Proposer shall also list all registrations, licenses, and certifications held by members of the Proposer Team by number and classification, the name of the organization or individual holding the license, the renewal date of each license, and whether each license is active.</p> <p>Proposal Form 2 shall, at a minimum, confirm the Proposer name and identify the Proposer Team members, including their Key Personnel and other significant team members, that will perform each of the following services:</p> <ul style="list-style-type: none"> a) Software/system development b) Hardware development/supply c) Hardware installation (Vehicle, etc.) d) System/software management, maintenance and configuration e) Retail partnership development f) Retail partnership management and stock delivery g) DB Oversight |

VOLUME 1: GENERAL INFORMATION

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| | | <ul style="list-style-type: none"> h) Preliminary Design i) Web design j) Web maintenance k) UI Design l) Payment Service Provider(s) m) Hardware maintenance n) Budgeting & Reporting o) Accessibility certification and compliance p) Order fulfillment q) Cash collection/counting r) MBTA Expansion coordination s) New providers expansion coordination t) Qualified Security Assessments u) Safety assessments v) Hardware Testing w) Software Testing x) Training instruction y) Project management z) Financial advisor and/or Underwriter aa) Legal advisor bb) Lender(s) cc) Lead Arranger(s) dd) Other (please specify) <p>Note: If there have been any changes or additions to team members or Key Personnel as were specified in the Proposer's SOQ, any such changes shall be approved by the MBTA.</p> |
| 1-3 | New Key Personnel (Proposal Form 3) | For each new Key Personnel that the Proposer intends to use that were not identified in the Proposer's SOQ, Proposer shall submit a completed Proposal Form 3 (New Key Personnel) and resumes. The resumes must include the Key Personnel's education, work history, and relevant experience with similar responsibilities. Each resume shall not exceed two pages. |
| 1-4 | New Proposer Team Members (Proposal Form 4) | For each Proposer Team member listed on Proposal Form 2 that was not identified in the Proposer's SOQ, Proposer shall submit a completed Proposal Form 4 (New Proposer Team Members). |

| VOLUME 1: GENERAL INFORMATION | | |
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| 1-5 | Relationship Disclosure (Proposal Form 5) | Proposer shall disclose all relevant relationships by submitting a completed Proposal Form 5 (Relationship Disclosure Form), in accordance with the instructions set forth Section 3.24.2 of the RFP. |
| 1-6 | Ownership (Proposal Form 6) | Proposer shall complete and submit Proposal Form 6 (Statement of Ownership). |
| 1-7 | Proposer Team Member and Key Personnel Commitment (Proposal Form 7) | Proposer shall complete and submit Proposal Form 7 (Form of Commitment of Equity Members, Major-Non Equity Members, Guarantors, Project Contractors, Subcontractors and Key Personnel), by which Proposers confirm that the Equity Members, Major Non-Equity Members, Guarantors, Key Personnel, Project Contractors and Subcontractors identified in the Proposer's SOQ remain fully committed to the Project, and that any new Proposer Team Members and Key Personnel identified in the Proposer's Proposal are also fully committed to the Project. |
| 1-8 | Guarantor Acknowledgment and Related Information (Proposal Form 11) | <p>Proposer shall submit Proposal Form 11 (Guarantor Acknowledgment) on letterhead signed by each Guarantor demonstrating the Guarantor's commitment to execute the Guaranty Agreement. The Guarantor Acknowledgment shall be signed by an authorized representative of the Guarantor who is empowered to commit the Guarantor to the obligations contained in the Guarantor Acknowledgment. A Certificate of Authorization (Attachment 11A to the Guarantor Acknowledgment) attesting to such authorization shall also be submitted with the Guarantor Acknowledgment.</p> <p>Proposers may propose enhancements to the Guarantor identified in the Proposer's SOQ. Proposers must detail how the enhancements make the financial strength of the Guarantor better than the financial strength of the Guarantor as set forth in the Proposer's SOQ. The MBTA, in its sole discretion, may consent or decline to consent to any such enhancements.</p> <p>Proposers may also propose changes to the Guarantor. If the Proposer seeks to change the Guarantor, the Proposer must present to the MBTA the qualifications of the Guarantor in full, as required by the RFQ, prior to submitting its Proposal. The MBTA must consent to any change in the Guarantor before Proposer may include such Guarantor in its Proposal.</p> |
| 1-9 | State Certifications (Proposal Form 15) | Proposer shall complete and submit Proposal Form 15. |

| VOLUME 1: GENERAL INFORMATION | | |
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| 1-10 | Security Certification (Proposal Form 16) | Proposer shall complete and submit Proposal Form 16. |
| 1-11 | Security Sensitive Information – Non-Disclosure and Confidentiality Agreement (Proposal Form 17) | Proposer shall complete and submit Proposal Form 17. |
| 1-12 | Security Sensitive Information – Certification and Conditions of Custody (Proposal Form 18) | Proposer shall complete and submit Proposal Form 18. |
| 1-13 | Stipend Agreement (Proposal Form 19) | If Proposer wishes to be eligible to receive a Stipend, Proposer shall execute and deliver Proposal Form 19. |
| 1-14 | Reference Projects (Proposal Form 21) | Proposer shall complete and submit Proposal Form 21. |
| Package 2 – Confirmation of SOQ and Executive Summary | | |
| 1-15 | Confirmation of SOQ and Relevant Updates | Proposers shall confirm that all information provided in the Proposer’s SOQ remains true and accurate, or, if any such information is no longer true or accurate, then provide updated information that is true and accurate. |
| 1-16 | Executive Summary of Proposal | Proposers shall submit an Executive Summary of their Proposal, which shall not exceed 10 pages. The Executive Summary shall not contain any information relating to pricing. |
| 1-17 | Description of General Understanding and Approach | Proposers shall submit a narrative which summarizes the Project approach, demonstrates a general understanding of the Project objectives identified in Section 2.3 of the RFP and the scope of the Contract Services identified in Section 2.4 of the RFP, and which describes how the proposed approach best fits the MBTA’s objectives and needs. The narrative shall not exceed 10 pages. |
| Package 3 - Structure of the Proposer and relationship with the MBTA | | |
| 1-18 | Structure of the Proposer | Proposers must provide a narrative description of the legal structure of the Proposer and the existing or anticipated contractual relationship between Proposer Team Members. Proposers shall submit qualifications and experience of |

| VOLUME 1: GENERAL INFORMATION | | |
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| | | additional firms included as part of the Proposer Team on Proposal Form 4 (New Proposer Team Members) for which qualifications and experience were not provided as part of its SOQ. Proposals shall describe the existing or anticipated contractual relationship between Proposer Team members. Proposers must comply with the requirements of Section 3.25 of this RFP for any proposed changes to the Proposer Team. |
| 1-19 | Organizational Charts | <p>Proposer shall submit the following three organizational tables/charts:</p> <ul style="list-style-type: none"> • a figure indicating the roles of each member of the Proposer Team, and, if any such entity is a joint venture, the percentage ownership of each such joint venture entity • a figure showing the relationship between any member of the Proposer Team and any Guarantors • a corporate organizational chart that reflects all direct and indirect owners of the entity that would serve as the Systems Integrator, and the percentage ownership held by each such direct and indirect owner in its directly held entities up to the level of each Equity Member and Guarantor. Such figure should also reflect general partners and investment managers/advisors of any investment funds reflected in the chart |
| 1-20 | Relationship with the MBTA | The Proposer must describe the management structure of the Proposer Team Members and their roles in interacting with the MBTA. |
| 1-21 | Affirmative Action/EEO Plan | The Proposer shall submit an Affirmative Action/EEO Plan for all Project Contracts which exceed \$50,000 in value. |
| Package 4 – Early Works Proposal | | |
| 1-22 | Proposal Form 20A | If the Proposer intends to enter into the Early Works Agreement, the Proposer must complete Proposal Form 20A. |
| 1-23 | Scope of Early Works and Hours and Quantities | <p>The Proposer shall propose a scope of Early Works. The Early Works must include the following:</p> <ol style="list-style-type: none"> 1) the completion of the Cost-Certain Specifications; 2) Project Schedule; 3) Project Management Plan; 4) Project status dashboard; |

VOLUME 1: GENERAL INFORMATION

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| | | <p>5) Submittal tracking tool;</p> <p>6) Submittal schedule; and</p> <p>7) Template for Design Review feedback.</p> <p>For each proposed Early Work, the Proposer shall include estimated hours of labor and estimated quantities of materials, goods and equipment and an estimated date of completion.</p> <p>The Proposer shall not include any pricing information in its Early Works Proposal.</p> |
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VOLUME 2: TECHNICAL PROPOSAL

Volume 2 must provide sufficient information to reasonably demonstrate that the Proposer can meet the Systems Integrator’s responsibilities and obligations in executing the Project, and other required services in accordance with the requirements set out in this RFP and the Draft Project Agreement.

The successful Proposer will be required to deliver the Project in conformance with its Proposal.

The Proposal Submittal Requirements (PSRs) for the Technical Proposals are listed in Schedule F to this RFP and described in Schedule C to this RFP. All PSRs marked as “Required” must be included in the Technical Proposal. In the event any PSRs marked “Required” are not included in the Technical Proposal, the Proposal may be deemed non-responsive. Note that additional PSRs may be required depending on the Proposer’s approach.

Volume 2 shall be organized into topical sections in the order set forth below. Each section shall start with a table of contents listing the PSRs included in such section and the PSR’s submittal tracking number and description, as identified in Schedule F to this RFP. Optional PSRs which are not included in the Proposal shall be included in the table of contents and marked as N/A. For PSRs with a response longer than one page, the table of contents shall also list the page number on which the response to the PSR begins. For PSRs with a response shorter than one page, the response to the PSR may be included directly in the section’s table of contents. Schedule C describes the requirements for each submittal. Unless otherwise specified, there is no minimum or maximum length for submittals.

Order of Volume 2 Sections:

- 2-1: Accessibility and Language
- 2-2: System Capabilities and Information Security
- 2-3: Implementation, Expansion, DB Oversight and Testing
- 2-4: Management, Maintenance and Reporting
- 2-5: Devices (excluding Gate Transition)
- 2-6: Readers
- 2-7: Quantity Standards and Retail
- 2-8: Privacy
- 2-9: Fare Card and Order Fulfillment
- 2-10: Revenue Collection and Remittance

2-11: Application Programming Interfaces
2-12: DB Plans and Specifications

VOLUME 3: FINANCIAL PROPOSAL

In Volume 3, the Proposer must demonstrate that its financial model and plan are well developed and robust and that it has sufficient support from Equity Members for the Project.

The Financial Proposal shall be organized in the order listed below, and shall be clearly indexed. Each component of the Financial Proposal shall be clearly tabbed, titled and identified.

As stated above, evidence of signature authority shall be provided for all individuals signing forms. Proposal Form 13 identifies requirements regarding evidence of signature authorization for the Financial Proposal Letter. Similar authorization shall be provided for all other signatories.

The Financial Plan will be appended to the Project Agreement as Appendix 15. Other parts of the Financial Proposal will be appended to the Project Agreement as noted.

All financial information provided in the Financial Proposal shall be in United States Dollar currency.

If there are any discrepancies between the hard copy and electronic copy of any quantitative information provided in the Financial Proposal, the MBTA, in its sole discretion, shall determine which copy shall control and take precedence. If there are any differences between the sum of individual line amounts and totals, the individual line amounts will prevail.

| Section No. | Title | Contents |
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| Package 1 - Financial Proposal Letter | | |
| 3-1 | Financial Proposal Transmittal Letter (Proposal Form 1B) | <p>Submit a fully executed and notarized Proposal Form 1B (Financial Proposal Transmittal Letter).</p> <p>The Financial Proposal Transmittal Letter and all attachments thereto shall be signed by a representative of the Proposer who is empowered to sign it and to commit the Proposer to the obligations contained in the Proposal. The Financial Proposal Transmittal Letter shall include the following attachments:</p> <ul style="list-style-type: none"> (1) Attachment 1 – Certificate of Authorization (2) Attachment 2 – Statement justifying records marked as proprietary or trade secret (if applicable) |
| 3-2 | Financial Proposal Letter (Proposal Form 13) | <p>Proposer shall complete and submit Proposal Form 13. The Proposer shall attach to the Financial Proposal Letter evidence of authorization to execute and deliver the Financial Proposal, the Project Agreement and all other documents required to be executed by the Proposer or Systems Integrator or in connection with the Project Agreement and award of the Project Agreement, and shall identify its authorized representative(s). If Proposer is a consortium, partnership or any other form of joint venture, then the Equity Members of Proposer may each execute a single document authorizing a nominated and identified representative</p> |

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| | | to execute documents on their behalf in respect of the Proposer. |
| 3-3 | Proposal Letter of Credit (Proposal Form 8) | Proposer shall submit Proposal Form 8 (Form of Proposal Letter of Credit) on letterhead from the Qualified Commercial Bank issuing the Proposal Letter of Credit. The proposed Qualified Commercial Bank must comply with the requirements set forth in the Draft Project Agreement. |
| 3-4 | Proposed Security Package | Proposer shall describe the security package the Proposer expects to obtain to secure its payment and performance obligations under the Project Agreement. |
| 3-5 | Insurance Letter of Intent (Proposal Form 10) | Proposer shall provide Proposal Form 10 (Insurance Letter of Intent) on letterhead for the insurer the Proposer expects to use to provide the Required Insurance. |
| | Package 2 - Financial Statements and Credit Ratings | |
| 3-6 | Financial Information Summary | <p>If any of the information presented in the Financial Information Summaries (RFQ Form D-7) of the Proposer, Equity Member(s), Major Non-Equity Member(s) and Guarantor(s) included in the Proposer's SOQ is no longer accurate, Proposer shall submit an updated Financial Information Summary for each entity for which the information is no longer accurate.</p> <p>For unchanged items, the Proposer should indicate that the information contained in the SOQ is current.</p> |
| 3-7 | Financial Statements | <p>To the extent any of the required financial statements previously provided as part of the Proposer's SOQ have been amended or restated, Proposer shall submit the amended or restated financial statements.</p> <p>For unchanged financial statements, Proposer should indicate that the information contained in the SOQ is current.</p> <p>To the extent that financial statements are available for the Proposer, Equity Members and Major Non-Equity Members for the most recent fiscal year which are more recent than the financial statements provided in the SOQ, the Proposer shall provide the most recent financial statements for the Proposer, Equity Members and Major Non-Equity Members, as applicable. To the extent that a Major Non-Equity Member has provided a Guarantor for all their obligations under the Project Agreement, only the financial statements of the Guarantor are required to be submitted. The following are the required financial statements:</p> <ul style="list-style-type: none"> • Opinion letter (auditor's report); • Balance sheet; |

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| | | <ul style="list-style-type: none"> • Income statement; • Statement of changes in cash flow; and • Footnotes. <p>In addition, the financial statements must meet the following requirements:</p> <ul style="list-style-type: none"> • For US entities, prepared in accordance with US Generally Accepted Accounting Principles (GAAP) and audited by a Certified Public Accountant (CPA). For non-US entities, prepared in accordance with International Financial Reporting Standards (IFRS) and audited by a CPA equivalent. • If any entity provides financial statements prepared in accordance with principles other than US GAAP or IFRS, a letter must be provided from a certified public accountant, or equivalent, discussing the areas of the financial statements that would be affected by a conversion to US GAAP or IFRS. • If audited financials are not available for a member of the Proposer Team, the Proposal must include unaudited financials for such member, certified as true, correct, and accurate by the Chief Financial Officer (CFO) or treasurer of the entity. If any entity required to submit financial statements is a newly formed entity and does not have independent financial statements, such entity shall expressly state that it is a newly formed entity and does not have independent financial statements meeting the requirements above and shall provide financial statements otherwise consistent with those required hereby for each of its shareholders/equity members. • If the Proposer, a member of the Proposer’s team, or any other entity for which financial information is submitted as required hereby files reports with the Securities and Exchange Commission (SEC), then such entity must provide electronic links to the most recently filed Forms 10K, 10-Q and 8-K for all such reporting entities in lieu of hard copies. • Financial statement information must be prepared in English. If audited financial statements are prepared in a language other than English, translations of all financial statement information must be accompanied with the original financial statement information. • If financial statements are not available in US dollars, the Proposer must include summaries of the income statement, balance sheet and cash flow statement for the applicable time periods converted to US dollars. If financial statements are converted from a foreign currency into US dollars, the conversion method(s) must be explained in an attachment and must be reasonable. Translation at the average period |
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| | | rate for income statements and cash flow statements, and period end rate for balance sheet statements, shall be appropriate. |
| 3-8 | Non-Investment Fund Equity Letter of Support | <p>If an Equity Member is proposing the funding of an equity commitment through the use of funds other than internal resources, financial statements and a completed RFQ Form D-7 (Financial Information Summary) must be provided as described above for the corporate entity supplying the capital. In addition, the Proposer must provide a one-page letter from the chief executive officer, chief financial officer, or treasurer of the corporate entity that certifies the following:</p> <ul style="list-style-type: none"> • Where and how the equity commitment will be sourced; • A description of how competing allocation and capacity issues are considered between several project opportunities the entity pursues simultaneously; • The investment amount and type meets all corporate strategy and investment policy requirements; and • The approval process for such equity investment, including completed to-date and remaining approval milestones required to commit to and fund the required equity commitment for the Project. <p>To the extent the above information was previously provided as part of the Proposer’s SOQ, only those sections that have changed need to be submitted. For unchanged items, the Proposer should indicate that the information contained in the SOQ is current.</p> |
| 3-9 | Investment Fund Equity Letter of Support | <p>For any Equity Member of the Proposer Team that is an investment fund, the specific fund must be stated. If an Equity Member is a general partner that manages multiple funds, it must specifically identify from which fund it intends to ultimately source the equity investment for the Project and provide the required financial information for that specific investment fund. Additionally, for entities that are fund managers of an investment fund, financial statements must be provided for the fund manager, the limited partnership(s) constituting the investment fund and the general partner(s) of the investment fund. In addition, the Proposer must provide a one-page letter from the chief executive officer, chief financial officer or treasurer of the investment fund that certifies the following:</p> <ul style="list-style-type: none"> • The investment capacity of the fund; • A description of how competing allocations and capacity issues are considered between several project opportunities the entity pursues simultaneously; • The ownership structure of the various entities in the hierarchy of the fund; |

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| | | <ul style="list-style-type: none"> • The investment criteria of the fund and confirmation that the anticipated investment amount and investment type are permitted under the criteria; • The approval process for such equity investment; and • The description of recent material changes in the organization of the fund. <p>To the extent the above information was previously provided as part of the Proposer’s SOQ, only those sections that have changed need to be submitted. For unchanged items, the Proposer should indicate that the information contained in the SOQ is current.</p> |
| 3-10 | Credit Ratings | <p>To the extent the credit ratings of the Proposer, Equity Member, Major Non-Equity Member and Guarantor included in the SOQ are no longer accurate, Proposer shall supply accurate credit ratings.</p> <p>For unchanged items, the Proposer should indicate that the information contained in the SOQ is current.</p> |
| 3-11 | Material Changes | <p>In the event there has been a material change in the financial condition of the Proposer, Equity Member, Major Non-Equity Member or Guarantor since the SOQ Submittal Date, Proposer shall provide a statement describing each material change in detail, the likelihood that the developments will continue during the Term, and the projected full extent of changes likely to be experienced in the periods ahead. Estimates of the impact on revenues, expenses and the change in equity shall be provided separately for each material change as certified by the CFO or treasurer. Where a material change will have a negative financial impact, the affected entity shall also provide a discussion of measures that would be undertaken to insulate the Project from any recent material changes, and those currently in progress or reasonably anticipated in the future.</p> <p>List of Representative Material Changes</p> <ul style="list-style-type: none"> • An event of default or bankruptcy involving the affected entity, a related business unit within the same corporation, or the parent corporation of the affected entity; • A change in tangible net worth of 10% of net assets; • A sale, merger or acquisition exceeding 10% of the value of net assets prior to the sale, merger or acquisition which in any way involves the affected entity, a related business unit, or parent corporation of the affected entity; • A change in credit rating for the affected entity, a related business unit, or parent corporation of the affected entity; • Inability to meet conditions of loan or debt covenants by the |

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| | | <p>affected entity, a related business unit or parent corporation of the affected entity which has required or will require a waiver or modification of agreed financial ratios, coverage factors or other loan stipulations, or additional credit support from shareholders or other third parties;</p> <ul style="list-style-type: none"> • Following the SOQ Submittal Date, the affected entity, a related business unit in the same corporation, or the parent corporation of the affected entity either: (i) incurs a net operating loss; (ii) sustains charges exceeding 5% of the then net assets due to claims, changes in accounting, write-offs or business restructuring; or (iii) implements a restructuring/reduction in labor force exceeding 200 positions or involves the disposition of assets exceeding 10% of the then shareholder equity; • Other events known to the affected entity, a related business unit or parent corporation of the affected entity which represents a material change in financial condition over the past three years or may be pending for the next reporting period. <p>If no material changes have occurred or are pending since the SOQ Submittal Date, Proposer or any member of the Proposer Team, as applicable, shall provide a letter from its CFO or treasurer so certifying.</p> |
| | Package 3 – Financial Plan | |
| 3-12 | Financial Plan Memorandum | <p>The Financial Proposal shall include a Financial Plan Memorandum that contains the following:</p> <p>(1) <u>Overview</u> – A 2-page narrative overview of the Proposer’s Financial Plan, including a summary of :</p> <ul style="list-style-type: none"> (a) the amount to be obtained from each financing source during design and implementation, including debt and equity financing and the identity of the provider thereof; (b) the projected total revenues and expenditures for the Systems Integrator, with sufficient detail to understand major revenue and cost drivers; (c) drawdown, repayment, and distribution terms and schedules; (d) Benchmark Interest Rates and credit spreads; (e) return assumptions; and (f) a succinct description of creditworthiness, drawdown priority and cash-flow waterfall seniority considerations. <p>(2) <u>Project Structuring Information</u> – In addition to the amounts (for each time period) provided in the Bid Financial Model and the Assumptions and Instructions book, Proposer will provide the following information:</p> <ul style="list-style-type: none"> (a) Details about the upfront development costs: <ul style="list-style-type: none"> (1) Up-front fees to be payable in connection with |

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| | | <p>any Project Debt and Deferred Equity LCs, including fees for loan arranging, bond underwriting, sale of debt securities in a Private Placement, letter(s) of credit, swaps, guarantee(s) or other financing fees;</p> <p>(2) Non-financing expenses such as Proposal development costs (including design and engineering work), legal, accounting, tax, financing and other advisory fees, and Lenders' due diligence; and</p> <p>(3) Details regarding the nature of the services or work provided and the payee(s) of any expense item in excess of \$1 million (an unspecific expense item (in particular, those categorized broadly as "other", "general development", "sponsors", "consortium", "contingency" or similar descriptions) can only be used to group amounts with a combined value of less than \$500,000; provided that a general expense item that is explained in detail will not be subject to the \$500,000 cap amount);</p> <p>(b) Rationale for the funding or drawdown of reserve accounts, including funding and release timing and sources and/or the use of substitute letters of credit;</p> <p>(c) Local, State, and federal tax treatment, including tax rates, revenue and expense recognition, taxation of distributions, and other relevant assumptions;</p> <p>(d) Macroeconomic (including inflation) assumptions (Proposers should assume that the Inflation Index (CPI-U) is 2.5% per annum in accordance with the methodology set out in Appendix 8 of the Agreement. i.e., Availability Payments are inflated each July 1 based on the inflation factor for the prior December. (i.e., the inflation factor in FY2018 is 1.00, in FY2019 it is 1.025 etc.);</p> <p>(e) An assessment of potential impacts and a description of mitigation measures related to any refinancing risk that may be contained in the Financial Plan; and</p> <p>(f) Post-Financial Close interest rate hedging strategy and the risk mitigation strategy with respect to inflation (if any).</p> <p>(3) <u>Revenues and Cash-Flow Waterfall</u> – Proposer shall describe all sources of revenue, including the Availability Payments (APC, APO and APT separately identified). Proposer must describe funds which may be used to supplement such revenues (e.g., insurance proceeds, security packages, and reserve funds) as and when needed during the Implementation Period and Operating Period.</p> |
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| | | <p>(4) <u>Financing Sources</u> – Proposer shall provide the following details regarding its private financing structure:</p> <p>(a) In relation to its equity resources, the Proposer shall:</p> <ul style="list-style-type: none"> (i) Describe its approach to investing equity (using one or more instruments); (ii) Describe the percentage of the total Equity Investment to be made by each Equity Member and each Equity Member's investment horizon. Describe any future equity transfers anticipated by any Equity Member(s), including those occurring at the close-off of investment funds should they mature before the end of the Term. To the extent Equity Investments (including any extensions of Subordinate Debt) or distributions/repayments will be made at different times by/to different Equity Members, details regarding the nature and timing of such arrangements, as well as the investment profile and return shall be provided for each Equity Member; (iii) Describe Proposer's Bid Equity IRR build-up over the Term and the extent to which the Equity Members will retain an incentive to cause the Systems Integrator to perform all obligations under the Project Agreement, including the Handback Requirements, through and until the end of the Term; (iv) Provide Developer's net profit distribution policies, including distributions arising from refinancing of debt or tax-related lease transactions; and (v) State dividend restrictions assumed (if any) based on Lenders' requirements, applicable law, and accounting policies and rules. <p>(b) In relation to any Project Debt or Deferred Equity LCs, Proposers shall:</p> <ul style="list-style-type: none"> (i) List and describe each source and/or issuer of Project Debt and issuer of Deferred Equity LCs intended for use (e.g., bank loans, capital market securities, sale of debt securities in a Private Placement, other government-sponsored or subsidized loans, credit enhancements, any swaps or synthetic structures, letters of credit, and subordinated facilities); (ii) State the maximum leverage allowed by Lenders, and how it is being calculated, as well as all applicable debt service coverage |
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| | | <p>ratio ("DSCR") requirements (annual, project life, loan life coverage ratios) with respect to average and minimum levels;</p> <p>(iii) State the legal and average maturity of each Senior Debt facility, any principal or interest deferral periods, and drawdown/availability periods;</p> <p>(iv) State the cost of each Project Debt and Deferred Equity LC (including details of Benchmark Interest Rates, credit spread assumptions and all other related fees) and, if used, credit enhancements, hedging instruments, and interest rate swaps (for each period, if applicable); and</p> <p>(v) Describe the reserve accounts that Proposer will establish pursuant to requirements under its Funding Agreements and the Project Agreement, including to ensure compliance with financial covenants in the Funding Agreements and the Handback Requirements.</p> <p>These requirements can be met by providing this information in the Debt Term Sheets provided in Section 3-14.</p> <p>(5) <u>Sensitivity Analysis</u> – Proposer shall include a sensitivity analysis in accordance with the following requirements that demonstrates the strength of its proposed Financial Plan. The MBTA shall have the right to audit and review the Bid Financial Model to confirm the accuracy of the calculations provided by Proposer.</p> <p>For the variables listed below, Proposers shall present the effect of these variations on both the expected Bid Equity IRR and on the minimum and average DSCRs for the Senior Debt and for all other Project Debt. For these calculations, Proposer is to solve the Bid Financial Model to achieve the highest Bid Equity IRR while the Availability Payment is maintained. The Proposer shall state whether any financial covenants in any Funding Agreement would be breached under any of these scenarios.</p> <p>a. <u>Bid Equity IRR – Pre-Financial Close</u></p> <p>i. Benchmark Interest Rate fluctuation: the effects of a decline in all Benchmark Interest Rates (i.e., a parallel shift) in 25 basis point intervals from -25 to - 50 basis points, and an increase in all Benchmark Interest Rates in 25 basis</p> |
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| | | <p>point intervals from +25 to +100 basis points - Proposers that utilize multiple maturity debt facilities, such as with a bond financing, shall increase every rate in the term structure by 100 basis points (to account for each individual serial or term bond).</p> <p>b. <u>Bid Equity IRR – Post-Financial Close</u></p> <ul style="list-style-type: none"> i. Increases in Design & Implementation costs during implementation (without considering time delay implications, Availability Payment adjustments, or other financial implications related to those direct cost increases): both 5% and 10% increases. ii. Increases in O&M Services during implementation (without considering time delay implications, Availability Payment adjustments, or other financial implications related to those direct cost increases): both 5% and 10% increases. iii. Delayed Milestones: 1, 3 and 6 months delayed achievement of Revenue Service Commencement Date, Transition Period Completion Date, and Full Service Commencement Date (not caused by Supervening Events) compared to the dates included in Pro-Forma Table 3A. iv. Early Milestones: 1, 3 and 6 months early achievement of the Revenue Service Commencement Date, Transition Period Completion Date, and Full Service Commencement Date compared to the dates included in Pro-Forma Table 3A. <p>These requirements can be met by providing this information required in Pro-Forma Table 4.</p> |
| | | <p>(6) <u>Other Information</u> – If private placement or bond financing is included in the Financial Plan, the Proposer shall provide written confirmation signed by the Proposer’s authorized representative that the Lead Arranger on the Proposer’s team has acted as a lead arranger on over \$500m of comparable USD-denominated private placements/bonds issued within the past five years to finance infrastructure projects that were privately financed or delivered under public-private</p> |

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| | | partnership frameworks or similar structure and had a rating in the “BBB+”, “BBB” or BBB-” categories.” |
| 3-13 | Debt Term Sheets | <p>Proposer shall include copies of the final term sheets for each Project Debt facility (each, a “Debt Term Sheet”), the terms of which shall be agreed to by each Lender (including any underwriter or purchaser of a Private Placement (as evidenced by each Lender’s acceptance in its Debt Commitment Letter)), including, but not limited to,</p> <ul style="list-style-type: none"> (i) interest rates specifying the base rate and applicable margins, (ii) amounts in US Dollars of the facilities provided, (iii) customary conditions precedent to Financial Close, (iv) required documentation, (v) principal covenants (affirmative and negative), (vi) financing security (including guarantees), (vii) events of default, (viii) structural features, (ix) cover ratios, (x) reserve accounts and the requirements with respect to such accounts, (xi) redemption/prepayment features, (xii) drawdown schedule, (xiii) capital repayment grace period, (xiv) repayment schedule and final maturity date, (xv) flow of funds, (xvi) representations and warranties, (xvii) any proposed hedging arrangements in relation to interest rate risk, (xviii) arrangement and other fees, as applicable, and (xix) any other material terms and conditions relevant to the financing. <p>Where drafts of Funding Agreements are available, those must be provided.</p> |
| 3-14 | Debt Commitment Letters | <p>Proposer shall provide one or more letters (each a “Debt Commitment Letter”) from the Proposer’s Lender(s) and Lead Arranger(s), including any underwriters, purchasers of a Private Placement (each of the investors or the Private Placement Agent on behalf of the investors), monoline insurers and bank lenders, evidencing the relevant Lender’s commitment to underwrite or provide the full amount of the Project Debt facilities described in the Proposer’s Financial Plan and assumed in the Bid Financial Model. The MBTA recognizes that the nature of commitment available for bank and bond facilities will differ; however, each Debt Commitment Letter must comply with the following requirements:</p> |

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| | | <p>(a) Describe the Project Debt facility (or facilities) and/or hedging instrument(s) the relevant party will be providing and/or underwriting the amount(s) thereof, and for bond facilities, details of volume commitments;</p> <p>(b) If available, describe the Lender’s intentions with respect to any placement, arranging/syndication, sell-down or other marketing activities related to part or all of the committed/underwritten amount, versus the amount the Lender anticipates it will ultimately hold;</p> <p>(c) Indicate that the Lender has reviewed the final RFP and the Project Agreement issued by the MBTA, all applicable Addenda issued prior to the Financial Proposal Due Date, and that the Lender has completed all material aspects of its due diligence or all appropriate and necessary due diligence, including, in each case, financial, model, legal, technical, and tax reviews (except for any due diligence to be conducted by any underwriter in a Bond Financing necessary to comply with applicable securities laws). The RFP, the Project Agreement, and all other due diligence documents reviewed shall be listed in each Lender’s Debt Commitment Letter;</p> <p>(d) Confirm that (i) the required approvals have been obtained (and include any relevant evidence), (ii) such approvals are not, and will not be, subject to contingencies or conditions precedent other than those customary for projects similar to the Project and (iii) drawdowns from the relevant Project Debt facility will not be subject to contingencies or conditions precedent other than those customary for financings for projects similar to the Project (as described in the relevant Debt Term Sheet);</p> <p>(e) Include an anticipated date for Financial Close, a validity period for the commitment evidenced by the relevant Debt Commitment Letter (which must be no less than 180 days after the Financial Proposal Submittal Date), and indicate the extent to which (as applicable) volume commitments, credit spreads or other debt-related fees are locked or subject to market flex provisions through such anticipated date (or any other applicable date);</p> <p>(f) Include a description of the fees payable to the Lender or Lead Arranger;</p> <p>(g) Include, as applicable, the most recent ratings for the Lender(s) or Lead Arranger(s) providing such Debt Commitment Letter published by Rating Agencies and any rating actions which have occurred over the 12-month period prior to the date</p> |
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| | | <p>of such Debt Commitment Letter; and</p> <p>(h) Include any other material information that would be relevant to the financing, which must include the following:</p> <p>(i) Due diligence reports from all technical advisors performing due diligence for Proposer or its Lender(s) and/or Lead Arranger(s), in final form (the MBTA shall not be entitled to rely on those reports); and</p> <p>(ii) If the Financial Plan includes the sale of debt securities in a Private Placement, include (A) a letter from the Proposer or a report from BrokerCheck (https://brokercheck.finra.org/) confirming that the placement agent is properly registered as a broker-dealer with the Securities and Exchange Commission, the Financial Industry Regulatory Authority and in states where the prospective purchasers of such securities are located; (B) as part of the Debt Term Sheets or as a letter from the Proposer, confirmation that the Private Placement is expected to meet an exemption under Section 4(a) of the Securities Act of 1933, as amended, indicating which exemption is expected to be relied upon; and (C) a list of the purchasers of the Private Placement.</p> |
| 3-15 | Rating Service Letters | If the Financial Plan provides for the issuance of any rated securities by or on behalf of the Systems Integrator, Proposer shall provide indicative credit rating(s) by the Rating Service expected to rate the issuance. |
| 3-16 | Evidence of Committed Equity Investment | <p>Proposer shall provide written documentation of action(s) taken by each Equity Member’s board (or any other relevant corporate or governance body from which authorization is required), authorizing such Equity Member to submit the Proposal as a member of the relevant Proposer and acknowledging the portion of the Committed Equity Investment such Equity Member will be required to provide if its Proposer becomes the Systems Integrator – such as board resolutions or investment committee resolutions and execution copies of or detailed term sheets for any contribution agreements or shareholder/member agreements that includes the detailed terms and conditions describing how and when the Committed Equity Investment will be provided by the Equity Members.</p> <p>Such actions or agreements, as applicable, must acknowledge the equity transfer restriction provisions set forth in the Project Agreement. Where a Deferred Equity LC or Subordinate Debt is to be used, the Financial Proposal shall include letter(s) of support from the relevant Eligible LC Issuer issuing the Deferred Equity LC or Equity Member, as applicable. The letter(s) of support shall include the most recent ratings of the Eligible LC</p> |

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| | | <p>Issuer. Each Equity Member shall identify the exact funding source for such investment and demonstrate that all necessary funds will be readily available for the anticipated date of Financial Close (for example, CFO certification of fund availability).</p> <p>Proposer shall include written confirmation from the Guarantor stating that it is willing to provide a guaranty in relation to the availability of equity/quasi-equity for the Project, and that it has adequate funds available.</p> |
| 3-17 | Review by Eligible Surety or Qualified Commercial Bank issuing Letter of Credit | <p>In instances where Proposer's response to Section 3-12 contains descriptions of proposed or anticipated changes in the financial condition of Proposer or any other entity for which financial information is submitted as required hereby for the next reporting period, Proposer shall include a certification from Proposer's surety that will issue any required surety bonds and, if applicable, Proposer's letter of credit issuer that will issue any required letters of credit, that such entity's analysis specifically incorporates a review of the factors surrounding such changes and identifying any special conditions which may be imposed before issuance of surety bonds or letters of credit for the Project. If Proposer proposes to deliver a letter of credit for the Payment Bond, then a certification is required from both the surety that will issue the Payment Bond and from the issuer that will issue the letter of credit. For purposes of preparing the Financial Proposal, Proposer may append the letter(s) provided pursuant to Section 3-15 of this Schedule A.</p> |
| 3-18 | Commercial and Financial Close Work Plan | <p>Proposer shall provide the following information:</p> <p>(a) A narrative description, with references as appropriate, demonstrating Proposer's ability to satisfy the requirements relating to finalization of the Project Agreement and the ability to achieve Commercial and Financial Close within the timeframes set forth in Section 2.7 of the RFP and Article 4 of the Draft Project Agreement;</p> <p>(b) A narrative description of its approach to and anticipated schedule for satisfying all conditions precedent set forth in the Project Agreement and achieving Financial Close within the timeframe set forth in the Project Agreement, including the relative timing of Financial Close in relation to Commercial Close as indicated in the Project Agreement and Section 2.7 of the RFP;</p> <p>(c) A description of the actions the Proposer has taken and plans to take to ensure that Financial Close will occur no later</p> |

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| | | <p>than the Financial Close Deadline;</p> <p>(d) A description of alternative sources of debt or equity financing and when such financing could be secured in the event any portions of the Financial Plan cannot be delivered as described in the Financial Proposal;</p> <p>(e) A description of the final marketing and pricing strategy associated with each source of Project Debt and issuance of a Deferred Equity LC, including considerations such as excess lending capacity, underwriter volume and price commitments, capital market liquidity, credit enhancement (if any) and placement or arranging/syndication approach;</p> <p>(f) A description of the measures Proposer will take as an attempt to minimize exposure to Benchmark Interest Rate changes, including the Proposer’s ability to switch between sources of Senior Debt or Base Interest Rates, when appropriate.</p> |
| 3-19 | Financial Plan Summary Pro-Forma Tables (Proposal Form 14) | <p>All data provided in the Pro-Forma Tables must be generated by the corresponding Bid Financial Model mandatory worksheets, except for the data in Pro-Forma Table 3B(i) – Bank Debt Financing Data, which will come from the Debt Term Sheets. Proposers shall complete the Pro-Forma Tables in accordance with the instructions below.</p> <p><u>General Instructions</u></p> <p>(a) All data must be in nominal Dollars unless requested in an alternative format.</p> <p>(b) All data must be in gross amounts, excluding applicable sales tax or percentages.</p> <p>(c) There shall be no double-counting on any given table.</p> <p>(d) Cash Flow Available for Debt Service (“CFADS”) must be calculated in a manner that is consistent with the equivalent (or substantially similar) concept in the Proposer's Debt Term Sheets.</p> <p>(e) Non-material changes to Pro-Forma Table 3C, including the alteration or addition of line items not currently reflected, will be permitted to ensure consistency with each Proposer’s Debt Term Sheets. However, the general format of such Pro-Forma Table and the requested information must be presented as set forth in Pro-Forma Table 3C.</p> <p>(f) For Tables 1A, 1B, 2, 3C, and 3D Proposers need to provide information in Fiscal Years</p> <p><u>Pro-Forma Table 1A and 1B – Quarterly and Annual Implementation Period Sources and Uses Analysis</u></p> <p>(a) Design and Implementation expenditures: such amount</p> |

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| | | <p>must be reflected in year-of-expenditure Dollars.</p> <p>(b) Development and pursuit costs: expenses incurred by the Proposer/Systems Integrator in connection with services or work provided prior to and including Financial Close to develop the Proposal and subsequently reach Financial Close.</p> <p>(c) O&M During Implementation Expenditures: operating costs incurred by the Proposer/Systems Integrator before the Full Service Commencement Date.</p> <p>(d) Implementation Period SPV Costs (excluding insurance expenses): all SPV Costs of Systems Integrator to be incurred during the Implementation Period (excluding any amounts incurred in connection with insurance policies), including rating agency fees, general and administration costs and ad-hoc services.</p> <p>(e) Cash Taxes: any payable Taxes.</p> <p>(f) Ongoing financing fees: commitment fees and credit enhancement fees.</p> <p>(g) Interest expense: do not net out with interest income in row O of the tables.</p> <p>(h) Debt principal repayment: should multiple Debt facilities be used, please adapt the table to provide details for repayment of each Debt facility.</p> <p>(i) Dividends: any dividends payable during respective period.</p> <p>(j) Reserves: all amounts used to fund reserves. Provide details for all reserves including Debt Service Reserve Account, Major Maintenance Reserve Account, Vandalism Reserve Account, External Interfaces Reserve Account and Unplanned Expansions Reserve Account.</p> <p>(k) Other uses: provide details on other uses of funds.</p> <p>(l) Totals: total quarterly, annual and accrued uses figures must equal total quarterly, annual and accrued sources figures, respectively.</p> <p>(m) Senior Debt: Should multiple Senior Debt facilities be used, please adapt the table to provide details for each Senior Debt facility.</p> <p>(n) Equity: please include Equity Investment contributions or</p> |
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| | | <p>Equity bridge loans, as appropriate.</p> <p>(o) Interest income during Implementation Period: includes interest income earned on unutilized proceeds of Project Debt. Do not net out with interest expense in row G1 of the tables.</p> <p>(p) Deferred Equity LCs: all Deferred Equity LCs from one (1) or more Equity Members.</p> |
| | | <p><u>Pro-Forma Table 2 – Operating Period Capital Structure</u></p> <p>(a) Differentiate each cash-funded reserve or letter of credit.</p> <p>(b) Equity Investment must be based on a cash-on-cash calculation, not on an accounting value.</p> |
| | | <p><u>Pro-Forma Table 3A – Financial Plan Overview</u></p> <p>(a) Key Dates and Assumptions: list key financial dates and assumptions provided by MBTA that Proposers are required to assume within their Bid Financial Model</p> <p>(b) Price Proposal Evaluation Components:</p> <p>(i) Total Value for Initial Term: Net Present Value for the of all components of the Availability Payments (APC, APO, APT), discounted to the estimated Financial Close Date at 5% for the periods provided in Table 3A. The Evaluation assumes Revenue Service Commencement Date, Transition Period Completion Date and Full Service Commencement Date occur at the dates provided in Pro-forma Table 3A</p> <p>(ii) Unplanned Scenarios: Net Present Value of Unplanned Expansion Costs (EAPO) discounted to the estimated Financial Close Date at 13% over the Initial Term. Total value of Unplanned Labor calculated in Pro-Forma Table 6B (not discounted or inflated).</p> <p>(iii) Renewal Terms: Net Present Value for the Renewal Terms for APO and Other AP Transaction Rate, discounted to the estimated Financial Close Date at 13%.</p> <p>(c) Key Capital Structure Metrics: list of key Equity and Debt metrics</p> |
| | | <p><u>Pro-Forma Tables 3B(i) and 3B(ii) – Debt Financing Data</u></p> <p>(a) Debt Facilities: List Senior and Subordinate Debt facilities (if any) separately in Pro-Forma Table 3B(i) and Pro-Forma Table 3B(ii). In the case of debt facilities structured with multiple tranches or multiple maturities, provide information for</p> |

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| | | <p>the overall debt facility as well as each tranche or individual serial or term issuance.</p> <p>(b) Interest Rate(s): Include the Base Interest Rates and associated margin/credit spread for the variable part of interest, if applicable and fixed rate(s), if hedged (e.g., 4.5%). A multiple maturity debt facility (such as certain bond issuances) may be associated to more than one Base Interest Rate.</p> <hr/> <p><u>Pro-Forma Table 3C – Debt Coverage Ratios</u></p> <p>(a) Do not include any amount incurred on or before the Full Service Commencement Date.</p> <p>(b) Calculate the annual Debt Service Cover Ratio (“DSCR”) for Senior Debt and also Project Debt, which will be calculated as A/B for each, where:</p> <p>A = CFADS in each period; and B = all debt service (i.e., principal and interest) payable with respect to Senior Debt or Project Debt (as applicable) in each period, including the repayments of principal and interest due, net of hedging costs during the period and other financial costs such as commissions and fees.</p> <p>(c) Calculate the annual Project Life Coverage Ratio (“PLCR”) for Project Debt, which will be calculated as A/B, where:</p> <p>A = the aggregate of the net present value of future CFADS at any time, calculated using a discount rate equal to the weighted average cost of debt applicable at such time on all outstanding Project Debt; and B = the aggregate of the remaining principal obligations of the Project Debt (including any interest accruals added to the principal amounts due) minus the balance of the debt service reserve account for the remaining portion of the Term.</p> <p>(d) Calculate the annual Loan Life Coverage Ratio (“LLCR”) for Senior Debt and Project Debt, which will be calculated as A/B for each, where:</p> <p>A = the aggregate of the net present value of future CFADS during the remaining debt term, calculated using a discount rate equal to the weighted average cost of debt applicable at this specific period on all outstanding Senior Debt or Project Debt, as applicable; and B = the aggregate of the remaining principal obligations of the Project Debt (including any interest accruals added to the principal amounts due) minus the balance of any reserve account dedicated to debt repayment for the remaining portion of the</p> |
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| | | <p><u>Term.</u></p> <p><u>Pro-Forma Table 3D – Cash Funded Reserves (or Letters of Credit)</u></p> <p>Do not include any amount incurred on or before the Full Service Commencement Date. To the extent that a letter of credit is contemplated to be used to satisfy a reserve requirement, alterations may be made to this table, as needed.</p> |
| | | <p><u>Pro-Forma Table 4 – Sensitivity Analysis (Initial Term Only)</u></p> <p>Proposer shall include a sensitivity analysis in accordance with the following requirements that demonstrates the strength of its proposed Financial Plan. The MBTA shall have the right to audit and review the Bid Financial Model to confirm the accuracy of the calculations provided by Proposer.</p> <p>a. Bid Equity IRR – Pre-Financial Close</p> <p>For the variables listed below, Proposers shall present the effect of these variations on both the expected Total Value of the Initial Term and on the minimum DSCRs for the Senior Debt and for all other Project Debt. For these calculations, Proposer is to solve the Bid Financial Model to achieve the lowest Availability Payments while the Bid Equity IRR is maintained. The Proposer shall state whether any financial covenants in any Funding Agreement would be breached under any of these scenarios.</p> <p>i. Benchmark Interest Rate fluctuation: the effects of a decline in all Benchmark Interest Rates (i.e., a parallel shift) in 25 basis point intervals from -25 to - 50 basis points, and an increase in all Benchmark Interest Rates in 25 basis point intervals from +25 to +100 basis points - Proposers that utilize multiple maturity debt facilities, such as with a bond financing, shall decrease/increase every rate in the term structure by -25 to - 50 or +25 to +100 basis points accordingly (to account for each individual serial or term bond.</p> <p>ii. Option Pricing & Evaluation Scenarios: the effects of the MBTA electing to expand the system or amend certain technical requirements as provided in Pro-Forma Table 7</p> <p>b. Bid Equity IRR – Post-Financial Close</p> <p>For the variables listed below, Proposers shall present the effect of these variations on the Value of the Initial Term, the expected Bid Equity IRR and on the minimum DSCRs for the Senior Debt and for all other Project Debt. For these calculations, Proposer is to solve the Bid Financial Model to achieve the highest Bid</p> |

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| | | <p>Equity IRR while the Availability Payment is maintained in accordance with the terms of the Project Agreement (e.g., changes to APT, timing of milestones and associated payments are expected, as applicable). The Proposer shall state whether any financial covenants in any Funding Agreement would be breached under any of these scenarios.</p> <p>i. Increases in Design & Implementation costs during implementation (without considering time delay implications, Availability Payment adjustments, or other financial implications related to those direct cost increases): both 5% and 10% increases.</p> <p>ii. Increases in O&M Services during implementation (without considering time delay implications, Availability Payment adjustments, or other financial implications related to those direct cost increases): both 5% and 10% increases.</p> <p>iii. Fare Revenue increase and reduction by 15% in each year compared to the values provided by the MBTA</p> <p>iv. Standard Fare Card Enablements Increase and reduction by 25% per year compared to the values provided by the MBTA</p> <p>v. Delayed milestones: 1, 3 and 6 months delayed achievement of Revenue Service Commencement Date, Transition Period Completion Date, and Full Service Commencement Date (not caused by Supervening Events) compared to the dates included in Pro-Forma Table. 3A</p> <p>iv. Early milestones: 1, 3 and 6 months early achievement of the Revenue Service Commencement Date, Transition Period Completion Date, and Full Service Commencement Date compared to the dates included in Pro-Forma Table. 3A</p> <hr/> <p><u>Pro-Forma Table 5 – Price Proposal Form (Nominal \$)</u></p> <p><u>APC</u> – Proposers are required to provide a single APC for all quarters within the Initial Term. APC is not subject to inflation over the term of the Agreement. Periods before Q4 FY2020 are not taken into account for evaluation purposes. Evaluation assumes the Revenue Service Commencement Date, the Transition Period Completion Date, and Full Service Commencement Date occur at the dates provided in Pro-Forma Table 3A. APC in the Input Table for the first and last quarters of the Initial Term are to be for a full quarter.</p> <p><u>AP O&M</u> – Proposers are required to provide APO for all quarters from Q1 FY2021. APO for each quarter within a Fiscal</p> |
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| | <p>Year are required to be the same in real \$ terms. Within each sub-term (Initial Term, Renewal Term 1 and Renewal Term 2) APO costs may decrease each Fiscal Year-to-Fiscal Year in real \$ terms but cannot increase. APO cost for the first quarter of the Renewal Terms 1 and 2 may increase in real \$ terms from the last quarter of the Initial Term or Renewal Term 1 as applicable, but may not increase in real \$ terms for the remainder of the applicable Renewal Term.</p> <p>Evaluation assumes Revenue Service Commencement Date, Transition Period Completion Date and Full Service Commencement Date occur at the dates provided in Pro-forma Table 3A and the respective parts of the cashflow are to be calculated in accordance with the terms of Appendix 8, Attachment 1.</p> <p>APO in the Input Table for the first and last quarter of the Initial Term, Term 1 and Term 2 are to be for a full quarter. APO is subject to inflation in accordance with the Agreement at the Inflation Index (CPI-U). Proposers should assume is 2.5% per annum and inflation is applied each July 1 based on the inflation factor from the prior December (i.e., the inflation factor in FY2018 is 1.00, in FY2019 it is 1.025 etc.).</p> <p>To the extent that the Revenue Service Commencement Date is achieved in a Month prior to the date assumed in the Bid Financial Model, the APO payable (subject to inflation and adjustment in accordance with the Monthly Payment calculation worksheet) shall equal the average for the five (5) complete Fiscal Years from the Scheduled Full Service Commencement Date. The calculation of this shall not be constrained by requirement for APO to reduce Fiscal Year-to-Fiscal Year from Revenue Service Commencement Date assumed in Table 3A.</p> <p><u>AP Transactions</u> – Proposers are required to provide the total AP Transactions based on the MBTA provided MBTA Fare Revenue and MBTA Fare Transactions per Transaction Channel and the APT rate (% and \$/transaction) for each Transaction Channel as proposed by the Proposer in Pro-Forma Tables 5Ai, 5Aii, 5Bi and 5Bii.</p> <p>AP Transactions priced on a Transaction basis is subject to inflation in accordance with the Agreement at the Inflation Index (CPI-U) which Proposers should assume is 2.5% per annum and inflation is applied each July 1 based on the inflation factor from the prior December (i.e., the inflation factor in FY2018 is 1.00, in FY2019 it is 1.025 etc.).</p> <p>AP Transactions priced on a percentage of MBTA Fare Revenue</p> |
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| | | <p>is not subject to inflation.</p> <p>AP Transactions in the Input Table for the first and last quarter of the Initial Term, Renewal Term 1 and Renewal Term 2 (where applicable) are to be for full quarters.</p> <p>NOTE: For evaluation purposes, Proposers shall not include within APT (or APC or APO) Eligible Subtractions from Fare Revenue. Proposers may include working capital assumptions related to the timing of Eligible Subtractions within their Bid Financial Model but not the actual costs or subtraction from MBTA Fare Revenue.</p> <p><u>Total Expansion Costs</u> – Proposers are required to provide the total expansion costs for each Fiscal Year for Unplanned System Expansions per Pro-Forma Table 6A. Proposers are to include the Unit Cost, the Unit Installation Cost and the EAPO in the Fiscal Year that they occur. Proposers should assume that Unit Costs and Installation Costs are paid on the date the Unit is installed, and EAPO is paid monthly in accordance with the Agreement.</p> <p>EAPO in the Input Table for the last quarter of the Initial Term need to be in the full month convention.</p> <hr/> <p><u>Pro-Forma Table 5Ai/ii – Transaction Channel Pricing (Nominal \$) - Allowable / Other AP Transaction Rate (% of MBTA Fare Revenue) for the relevant Transaction Channel.</u></p> <p>Pro-Forma Table 5Ai refers to Allowable AP Transaction Rate and Pro-Forma Table 5Aii refers to Other AP Transaction Rate.</p> <p><u>MBTA Fare Revenue</u> – Estimated MBTA Fare Revenue for each Transaction Channel is provided by the MBTA for all Fiscal Years. The MBTA makes no commitments as to the actual level of Fare Revenue the Systems Integrator shall process during the term. This estimate and the resulting NPV of APT is for evaluation purposes only.</p> <p><u>Sum of [Allowable/Other] AP Transaction Rate</u> – This is the sum of the [Allowable AP Transaction Rate / Other AP Transaction Rate] for each Transaction Channel,</p> <p><u>Allowable AP Transaction Rate</u> – Proposers are required to include a % of MBTA Fare Revenue for each Transaction Channel.</p> <p>Allowable AP Transaction Rate is subject to periodic adjustment for movement in market pricing for provision of the services pursuant to Section 6 of Appendix 8. Only those items explicitly</p> |
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| | | <p>included in the definition of Allowable AP Transaction Fees are eligible for inclusion and periodic adjustment. For the avoidance of doubt Allowable AP Transaction Rate is not to include any Systems Integrator contingency or profit. Prior to financial close, the Systems Integrator shall be required to submit into escrow all necessary documents, agreements and calculations to support the basis of Allowable AP Transaction Rate.</p> <p><u>Other AP Transaction Rate</u> – Proposers are required to include a % of MBTA Fare Revenue for each Transaction Channel.</p> <p>Other AP Transaction Rate is not subject to any adjustment over the Term and is to cover the Systems Integrator for all costs (including contingency and profit) not provided explicitly within Allowable AP Transaction Fees. The Other AP Transaction Rate should be sufficient to cover all variable costs incurred by the MBTA that are not part of Allowable AP Transaction Fees and Eligible Subtractions from Fare Revenue. This may include Chargeback & PAYG Losses or avoidable downgrades the SI expects to incur which would not be included in Eligible Subtractions from Fare Revenue.</p> <p>NOTE: Proposers shall not include within APT (or APC or APO) Eligible Subtractions from Fare Revenue. Proposers may include working capital assumptions related to the timing of Eligible Subtractions within their Bid Financial Model but not the actual costs or subtraction from MBTA Fare Revenue.</p> <p><u>Pro-Forma Table 5Bi/ii – Transaction Channel Pricing (Nominal \$) – Allowable / Other AP Transaction Rate (\$/Transaction) for the relevant Transaction Channel (ct).</u></p> <p>Pro-Forma Table 5Bi refers to Allowable AP Transaction Rate and Pro-Forma Table 5Bii refers to Other AP Transaction Rate.</p> <p><u>Fare Transactions</u> – Estimated MBTA Fare Transactions for each Transaction Channel is provided by the MBTA for all Fiscal Years. The MBTA makes no commitments as to the actual level of Fare Transactions the Systems Integrator shall process during the term. This estimate and the resulting NPV of APT is for evaluation purposes only.</p> <p><u>Fare Card Enablements</u> – Estimated Fare Cards Enabled is provided by the MBTA for all Fiscal Years for Fare Cards. The MBTA makes no commitments as to the actual level of Fare Card Enablements the Systems Integrator shall be required to provide during the term. This estimate and the resulting NPV of APT is for evaluation purposes only. For evaluation purposes, all Enabled Fare Cards are assumed to be Long-Term Fare Cards,</p> |
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| | <p>regardless of whether the System Integrator has proposed a solution that includes Limited-Life Fare Cards.</p> <p>For Standard Fare Cards, Proposers are required to propose the unit cost for each Enablement (\$FY2017). For Temporary Fare Cards, The MBTA shall pay the Systems Integrator 25% of the price proposed for the Standard Fare Card.</p> <p><u>Allowable AP Transaction Rate</u> – Proposers are required to include a \$/Transaction rate for each Transaction Channel.</p> <p>Allowable AP Transaction Rate is subject to periodic adjustment for movement in market pricing for provision of the services pursuant to Section 6 of Appendix 8. Only those items explicitly included in the definition of Allowable AP Transaction Fees are eligible for inclusion and periodic adjustment. For the avoidance of doubt Allowable AP Transaction Rate is not to include any Systems Integrator contingency or profit. Prior to financial close, the Systems Integrator shall be required to submit into escrow all necessary documents, agreements and calculations to support the basis of Allowable AP Transaction Rate.</p> <p><u>Other AP Transaction Rate</u> – Proposers are required to include a \$/Transaction rate for each Transaction Channel.</p> <p>Other AP Transaction Rate is not subject to any adjustment over the Term and is to cover the Systems Integrator for all costs (including contingency and profit) not provided explicitly within Allowable AP Transaction Fees. The Other AP Transaction Rate should be sufficient to cover all variable costs incurred by the MBTA that are not part of Allowable AP Transaction Fees and Eligible Subtractions from Fare Revenue. This may include Chargeback & PAYG Losses or avoidable downgrades the SI expects to incur which would not be included in Eligible Subtractions from Fare Revenue</p> <p>NOTE: Proposers shall not include within APT (or APC or APO) Eligible Subtractions from Fare Revenue. Proposers may include working capital assumptions related to the timing of Eligible Subtractions within their Bid Financial Model but not the actual costs or subtraction from MBTA Fare Revenue.</p> <hr/> <p><u>Pro-Forma Table 6A – Unplanned System Expansion - Unit Price Form</u></p> <p>The MBTA expects over the life of the Project Agreement to require the Systems Integrator to expand the system for MBTA services, unrelated to any usage that may be required by Regional Transportation Providers. To secure committed pricing</p> |
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| | | <p>for certain expansion items, the MBTA requires Proposers to submit unit pricing that would, subject to the terms of the Project Agreement, apply to unplanned systems expansion in the future.</p> <p>It should be noted that there are some planned expansions included in the Project Agreement which must be included in the base proposal.</p> <p><u>Unit Cost</u> – Proposers are required to include pricing for the purchase of an individual unit based on the order size. The unit cost shall be inclusive of all procurement, component sourcing, manufacturing, certification, testing, and any freight costs, as well as: (a) all System Elements needed to deliver a fully-functional unit that complies with all the Technical Requirements for that particular unit (except those that apply in respect of its unique Location and installation characteristics); (b) the services, deliverables, and grants of rights that apply to that unit as set forth in Article 16 of the Draft Project Agreement; and (c) the initial Configuration and commissioning effort that is applicable to the unit (except such effort in respect of its particular Location and installation characteristics).</p> <p><u>Unit Installation Costs</u> – Proposers are required to include pricing for the installation of individual units. There should be no difference in the installation cost regardless of the size of the order.</p> <p><u>Expansion AP O&M</u> – Proposers are required to include the annual pricing for operations and maintenance of an additional unit. There should be no difference in the APO regardless of the size of the order.</p> <p>Please note that the Selected Proposer’s Pro-Forma Table 6A will be incorporated into the Project Agreement as Attachment 11-B to Appendix 11.</p> <hr/> <p><u>Pro-Forma Table 6B - Unplanned Labor – Work Classification Cost and Evaluation Scenario</u></p> <p><u>Work Classification Rates</u> – Proposers shall provide committed pricing for all Work Classifications included in the table.</p> <p><u>Total Unplanned Hours</u> – For evaluation purposes only, the MBTA has provided hours for each Work Classification in order to calculate a total value to include in the price evaluation.</p> <p><u>Value</u> – the value of providing the total unplanned hours for each Work Classification. This should be the total of the Work Classification Rate multiplied by the Total Unplanned Hours</p> |
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| | | <p>For the avoidance of doubt, the MBTA makes no commitment as to the actual quantities of any unplanned hours.</p> <p>Please note that the Selected Proposer’s Pro-Forma Table 6B, excluding the evaluation scenarios, will be incorporated into the Project Agreement as Attachment 11-A to Appendix 11. The hourly rates listed in the table will be escalated annually by CPI.</p> <p><u>Pro-Forma Table 7 – Option Pricing and Expansion Evaluation Scenarios</u></p> <p>Proposers shall provide committed option pricing for discrete changes to the Technical Requirements for areas where the MBTA believes there could be value to users. The MBTA shall review and decide whether or not to accept the option pricing prior to the Effective Date of the Project Agreement. Proposers are not to provide option pricing for other items other than those explicitly requested by MBTA in this table (or for Unplanned System Expansion as required in Table 6).</p> <p><u>No. 1 – Provide Change to Cash Users</u></p> <ul style="list-style-type: none"> Proposers are required to provide committed pricing to adjust their base proposal to amend Section 6.2-11 of Appendix 2.3 (Customer Facing Devices) to remove the requirement that all Customer-Facing Devices shall provide change to the Users. This pricing option will not be evaluated. <p><u>No. 2 – Unplanned System Expansion</u></p> <ul style="list-style-type: none"> For price evaluation purposes only, Proposers are required to develop a scenario that assumes the Systems Integrator is required to increase their baseline proposal for all items listed in Pro-Forma Table 6A by 35% based on the pricing provided in Pro-Forma Table 6A. Proposers are to assume the additional equipment is all installed and available for use at the beginning of FY2023 and available for the remainder of the Initial Term. Proposers should assume the prices included in Proposal Form 6A in the following proportions: <ul style="list-style-type: none"> 15% increase is purchased at the unit price in band A 10% Increase is purchased at the unit price in band B 5% increase is purchased at the unit price in band C 5% increase is purchased at the unit price in band D Proposers should assume that the MBTA shall make full payment for Unit Costs and Unit Installation Costs at beginning of FY2023 and make payment for the additional APO (assuming |
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| | | <p>APO is adjusted) for the remainder of the Initial Term in accordance with Appendix 8 (Payment Mechanism). Proposers should NOT include the increased System Equipment and associated APO during the Renewal Terms.</p> <ul style="list-style-type: none"> Proposers should assume that there is no change to other assumptions in base award (e.g. Fare Revenue, APT, Inflation etc.). <p style="text-align: center;"><u>No. 3 – No Planned Expansion</u></p> <ul style="list-style-type: none"> Proposers are required to provide committed pricing to adjust their base proposal to amend Section 2 of Appendix 2.8 (Expansion) to remove the Planned Expansions (MBTA Location Expansions and Vehicle Expansions). This pricing option will not be evaluated. <p>Please note that Row 1 of the Selected Proposer’s Pro-Forma Table 7 will be incorporated into the Project Agreement as Attachment 11-C to Appendix 11.</p> <hr/> <p><u>Appendix 8 – Table 6 - AP O&M by Month and Fiscal Year (FY 17 \$)</u></p> <p>Proposers are required to include within their Bid Financial Model the AP O&M by Month and Fiscal year (\$) that will be used to populate Table 6 of Appendix 8 of the Project Agreement at the Effective Date.</p> <ul style="list-style-type: none"> Values included in Table 6 should be for the full Month without taking into account the timing of Key Milestones within the financial model as this table is to be used as an input for Attachment 1 (Monthly Payment calculation) of Appendix 8 which will separately apply pro-rate the amounts based on the actual date the Key Milestone are achieved. To the extent that the Revenue Service Commencement Date is achieved prior to the Month that is assumed in the Financial Model, the APO payable (subject to inflation and adjustment in accordance with the Monthly Payment calculation worksheet) shall equal the average for the five (5) complete Fiscal Years from the Scheduled Full Service Commencement Date. Values are to be in real \$ without taking into account inflation as this will also be applied within the Monthly Payment calculation worksheet |
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| | | <p>To the extent a Compensation Event results in an increase to the Term, APO for the additional Month(s) shall be calculated pursuant to Section 13.5 of the Project Agreement.</p> |
| | | <p><u>Appendix 8 – Table 7 – Total AP Transaction Rates based on MBTA Fare Revenue</u></p> <p>Proposers are required to include within their Bid Financial Model the Total AP Transaction Rates based on MBTA Fare Revenue that will be used to populate Table 8 of Appendix 8 of the Project Agreement at the Effective Date.</p> |
| | | <p><u>Appendix 8 – Table 8 – Total AP Transaction Rates based on Transaction Units</u></p> <p>Proposers are required to include within their Bid Financial Model the Total AP Transaction Rates based on Transaction Units that will be used to populate Table 8 of Appendix 8 of the Project Agreement at the Effective Date.</p> |
| | | <p><u>Other Information</u></p> <p>Any other information relating to the Financial Plan that the Proposer considers to be material or valuable for offering the MBTA a better understanding of its Financial Proposal.</p> |
| | Package 4 – Bid Financial Model | |
| 3-20 | Bid Financial Model | <p>Proposer shall submit a Bid Financial Model. The format of the Bid Financial Model is at the discretion of the Proposer, but must comply with the requirements set out in this Schedule A.</p> <p>The Bid Financial Model, which generates the financial projections contained in the Financial Proposal, shall be an electronic file constructed in an MS Excel 2010 (or more recent version) (English United States) compatible format and shall not require the use of external modules. Proposers are encouraged to make the Bid Financial Model as user-friendly as possible. The Bid Financial Model shall satisfy each of the following requirements:</p> <p>(a) Each worksheet of the Bid Financial Model shall identify the version and the date of issue. If the Bid Financial Model MS Excel file is password protected, the password shall be provided. No part of the Bid Financial Model (cell, column, row, sheet, macro or otherwise) shall be separately hidden, locked or protected with a password. The Bid Financial Model shall be formatted to facilitate printing (e.g., row and column headers must be on every page of the printout).</p> |

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| | | <p>(b) Proposers are encouraged to avoid the use of circular references in calculations. When used, those shall be fully detailed and explained in the Assumptions and Instructions Book described in Section 3-22 of this Schedule A below. For all macros, all programming code shall be made visible (i.e., not password protected), well-structured and fully documented.</p> <p>(c) Other than an optional title/disclaimer and/or instructions worksheet, the Bid Financial Model shall use only the following three types of worksheets:</p> <ol style="list-style-type: none"> 1. Input worksheets – which shall include data and assumptions to be hard-coded but not calculations (very simple calculations that aid user review (e.g., $a + b = c$) and error check formulas are allowed, but should be explicitly referenced as a calculation and kept to a minimum in accordance with best practice); 2. Calculation worksheets – which shall consist of the individual calculations that support each line of all outputs and reports. There shall be no duplication of calculations nor shall input cells be hardcoded in calculation sheets; and Output worksheets (including the Pro-Forma Tables and graphs worksheets) – shall be used to display and generate model outputs. No input cells shall be hard coded in output sheets and no calculations, except for simple formulae such as sums and check totals must be performed here. <p>(d) Worksheet names shall be descriptive and not use spaces (e.g., titles such as “CashFlows” or “Cash_Flows” shall be used instead of “Cash Flows”).</p> <p>(e) A separate color coding scheme (e.g., blue font on yellow fill color) shall be consistently used for input cells and or cells that reference other worksheets. Other color coding can also be used, but must be fully explained in the model’s instruction worksheet (if used) and/or the Assumptions and Instruction Book.</p> <p>(f) For calculation or output worksheets (other than Pro-Forma Tables) using time periods, the following requirements apply:</p> <ol style="list-style-type: none"> 1. A given column shall generally be used for the same period in each of its occurrence (e.g., July 1, 2017 through June 30, 2018 for column G); unless modeling practices require the use of different time periods for different sheets when Implementation Period and Operating Period are modeled on separate sheets. (e.g. monthly periods for the Implementation Period and quarterly periods for the Operating Period); 2. A row shall generally contain only one formula, copied across all columns. Cells in which a different formula is used (e.g., the first column) shall be clearly indicated (e.g., by color or label); and |
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| | | <p>3. Values that are obtained from input worksheets shall be clearly indicated (e.g., by color or label).</p> <p>(g) The information in the Bid Financial Model and the Financial Plan must be displayed in either a monthly or quarterly, MBTA's fiscal year-basis (with quarters beginning on January 1, April 1, July 1, and October 1 and fiscal years beginning on July 1) during the Implementation Period and on a monthly, quarterly or semi-annual, MBTA's fiscal year-basis during the Operating Period.</p> |
| 3-21 | Assumptions and Instructions Book | <p>Proposer shall submit an Assumptions and Instructions Book providing:</p> <p>(a) The logical layout and structure of the Bid Financial Model, including the names of all worksheets and a description of the color coding and/or labeling scheme(s);</p> <p>(b) Key financial assumptions, the sources which constitute the basis of such assumptions and/or arguments about the adopted options for the construction of the Bid Financial Model and the execution of any related sensitivity analysis;</p> <p>(c) Sufficient information and instruction regarding the operation of the Bid Financial Model to ensure that the MBTA will be able to read, use and modify the data contained therein and to allow the MBTA to conduct a detailed sensitivity analysis;</p> <p>(d) A detailed description of the function and intended use of all macros (and each macro must be logically structured and well documented, i.e., the MBTA encourages the use of liberal comments within the programming code); and</p> <p>(e) A detailed update process of the Bid Financial Model (or Preliminary Financial Model) for Financial Close and refinancing.</p> |
| 3-22 | Financial Structuring Assumptions | <p>(a) Inflation: Proposers shall assume within their Bid Financial Model that Inflation Index (CPI-U) is 2.5% per annum from December 2016 (FY2017).</p> <p>(b) Accounting Practices: Financial information submitted by Proposers must be as internally consistent and transparent as possible in order to facilitate its evaluation. Proposers must fully reflect all financial information in accordance with generally accepted accounting principles (or non-GAAP as permitted hereunder) in the preparation of the Financial Plan and in the construction of the Bid Financial Model. Proposers shall make clear which accounting standard is being used, apply it consistently, and describe any areas that require a material interpretation and the applicable rule. In no circumstances will the MBTA be held responsible for incorrect or aggressive application of accounting standards.</p> <p>(c) Tax Regulations: Projections in accounting statements (i.e., balance sheet and profit and loss statement) must be provided in accordance with all applicable federal and state tax regulations. In no circumstances will the MBTA be held</p> |

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| | | <p>responsible for incorrect or aggressive tax assumptions.</p> <p>(d) Compliance with RFP: The Financial Plan and Bid Financial Model must not contain inconsistencies with any provision included this RFP, including the Project Agreement.</p> <p>(e) Interest Rates and Credit Spread Inputs: For Bonds, the Bid Financial Model should be able to separately accommodate interest rates and credit spreads for each and every Benchmark Interest Rate and term used in the Financial Plan (differentiating inputs for each facility, if applicable). The Bid Financial Model should be able to be solved for multiple term structures.</p> <p>For Bank Debt, to the extent that the Bid Financial Model is able to separately accommodate interest rates and credit spreads for each and every Benchmark Interest Rate and term used in the Financial Plan (differentiating inputs for each facility, if applicable), the Bid Financial Model should be able to solve for multiple term structures.</p> <p>To the extent that the Bid Financial Model is not able to calculate the swap rate based off the Benchmark Interest Rates, Proposers are required to provide information sufficient that the MBTA can re-perform the steps to develop the swap rate(s). This is expected to include as a minimum (i) step-by-step screenshots on Bloomberg, showing the applicable swap rates have been used, the forward rates that were derived by using those rates, as well as any supporting screenshot(s) and/or calculations used to derive the final fixed rate(s) that are used in the bid model; and (ii) detailed assumptions, including detailed amortization schedule, floating rate, fixed rate day count, and floating rate day count.</p> <p>Project Debt should be priced without any forward component as if the trade was executed on the Benchmark Interest Rate Date and not to the estimated Financial Close; and in the case of interest rate swaps, priced without any swap margin.</p> <p>(f) Bid Availability Payment Escalation: The Bid Financial Model shall assume that:</p> <ol style="list-style-type: none"> 1. the Bid AP Capital is not indexed, 2. the AP O&M is indexed at the Inflation Index (CPI-U), 3. the AP Transactions calculated as a percentage of the estimated Fare Revenue per Transaction Channel is not indexed, 4. the AP Transactions calculated as \$ / Transaction Unit per Transaction Channel is indexed at the Inflation Index (CPI-U). |
| 3-23 | Bid Financial Model | <u>Input Data Requirements</u> |

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| | Elements | <p>The Bid Financial Model shall clearly indicate in one or more input worksheets all assumptions supporting the calculation of projections, including:</p> <ul style="list-style-type: none"> (a) Macroeconomic assumptions (including inflation); (b) Assumptions as provided by the MBTA (c) Accounting and federal, state and local tax assumptions pertaining to Systems Integrator; (d) Design and installation work expenditures, and other Capital Expenditures including development and pursuit costs (e) Assumptions relating to the Availability Payments; (f) Renewal Work expenditures, including allowances for Handback Requirements; (g) SPV Costs; (h) All financial metrics for debt and associated instruments (such as swaps), including Base Interest Rates and credit spread assumptions for applicable maturities within each debt structure; (i) All financing metrics for equity investments; (j) Funding source(s) and deposits into and drawdown of reserve accounts; and (k) Insurance-related payments, including expected deductible levels, premiums (the premium paid for each insurance policy shall be separately identified) and expected tax payments for each coverage. |
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| | | <p><u>Worksheets and Outputs</u></p> <p>(a) The Bid Financial Model shall dedicate a separate output worksheet for each of the following Pro-Forma Tables, which instructions are in Section 3-16 above:</p> <ol style="list-style-type: none"> (1) Pro-Forma Table 1A – Quarterly Implementation Period Sources and Uses Analysis (2) Pro-Forma Table 1B – Annual Implementation Period Sources and Uses Analysis (3) Pro-Forma Table 2 – Operating Period Capital Structure (4) Pro-Forma Table 3A – Financial Plan Overview (5) Pro-Forma Tables 3B(i) and 3B(ii) – Bank Debt Financing Data and Bond Financing Data (6) Pro-Forma Table 3C – Debt Coverage Ratios (7) Pro-Forma Table 3D – Cash-Funded Reserves (or Letters of Credit) (8) Pro-Forma Table 4 – Sensitivity Analysis (9) Pro-Forma Table 5 – Price Proposal Form (Nominal \$) (10) Pro-Forma Table 5Ai – Transaction Channel Pricing – Allowable AP Transaction Rate (%) for the relevant Transaction Channel (11) Pro-Forma Table 5Aii – Transaction Channel Pricing – Other AP Transaction Rate (%) for the relevant Transaction Channel (12) Pro-Forma Table 5Bi – Transaction Channel Pricing – Allowable AP Transaction Rate (\$/Transaction) for the relevant Transaction Channel (13) Pro-Forma Table 5Bii – Transaction Channel Pricing – Other AP Transaction Rate (\$/Transaction) for the relevant Transaction Channel (14) Pro-Forma Table 6A – Unplanned System Expansion - Unit Price Form (15) Pro-Forma Table 6B – Unplanned Labor – Work Classification Cost and Evaluation Scenario (16) Pro-Forma Table 7 – Option Pricing and Expansion Evaluation Scenarios (17) Appendix 8 – Table 6 - AP O&M by Month and Fiscal Year (FY17 \$) (18) Appendix 8 – Table 7 – Total AP Transaction Rates based on MBTA Fare Revenue (19) Appendix 8 – Table 8 – Total AP Transaction Rates based on Transaction Units <p>(b) Further, the Bid Financial Model shall include, at a minimum, each of the following output worksheets displaying information on an annual basis:</p> <ol style="list-style-type: none"> 1. Proposer Annual Balance Sheet; 2. Proposer Annual Profit & Loss Statement; and 3. Proposer Annual Cash Flow Statement. |
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| Package 5 – Miscellaneous | | |
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| 3-24 | Pre-Approved Equity Transfers | If the Proposer has submitted a request for, and the MBTA has approved, an anticipated equity transfer from a Qualified Investor to an Affiliate that would otherwise be prohibited under the Project Agreement, the Proposer shall submit a full copy of such approval, including any corresponding terms and conditions of such approval. |
| 3.25 | Equipment Price Catalogue (Proposal Form 22) | Each Proposer shall provide, on Proposal Form 22, an equipment price catalogue which lists subcomponent pricing for the Customer-Facing Devices. The prices listed in the catalogue shall represent the full price (index linked) that the MBTA will be required to pay in the event that the MBTA wishes to purchase any subcomponents from the Systems Integrator following the Expiration Date. |
| 3-26 | Termination Compensation Proposal Election | Proposers shall indicate their election as to whether they will utilize Option A (Bid Financial Model Termination Compensation Option) or Option B (Fair Market Value Termination Compensation Option), as each such option is set forth in Appendix 13 to the Draft Project Agreement. Proposers shall select only one such option to serve as the basis for their Financial Proposal. |

**SCHEDULE B
RESERVED**

SCHEDULE B

RESERVED

SCHEDULE C
TECHNICAL REQUIREMENTS

APPENDIX 2
DESIGN AND IMPLEMENTATION REQUIREMENTS

Table of Contents

Appendix 2.1 - [Reserved]

Appendix 2.2 - [Reserved]

Appendix 2.3 - Customer-Facing Devices

| | |
|--|----|
| 1. References and Standards | 3 |
| 2. General Requirements..... | 4 |
| 3. Requirements for All Customer-Facing Devices | 6 |
| 4. Process, Design Approach, and Operation and Maintenance Approach Requirements . | 24 |
| 5. Gate-Specific Requirements | 31 |
| 6. Fare Vending Machine Requirements..... | 50 |
| 7. Validator Requirements | 63 |
| 8. Gate Implementation Options | 65 |
| 9. Experience..... | 77 |

Attachment 1: MBTA Branding Guidelines

Attachment 2: MBTA Interface Control Document

Appendix 2.4 - Model Office

| | |
|---------------------------------|---|
| 1. Spaces | 1 |
| 2. Availability | 3 |
| 3. Functionality | 4 |
| 4. Modes of Operation | 5 |
| 5. Maintenance and Support..... | 5 |
| 6. Experience..... | 6 |

Attachment 1: Model Office Map

Appendix 2.5 - Communications Networks

| | |
|---|---|
| 1. Scope of the Communications Network | 1 |
| 2. Expansion to Other Parties Through Options | 2 |
| 3. Web-Based System Elements | 2 |
| 4. General Characteristics of the CN | 2 |
| 5. Use of MBTA Layer 2 Services..... | 6 |
| 6. Stations and In-Station Devices | 7 |
| 7. Non-Production Communications Network..... | 8 |
| 8. Experience..... | 8 |

Attachment 1: MBTA Layer 2 Services Locations

Attachment 2: MBTA Special Order 15-034

Attachment 3: Addendum No. 6 to Contract ITT46

Appendix 2.6 - Closed-Loop Fare Media

- 1. Fare Card Media 1
- 2. Fare Card Media Selection, Environmental Limits and Compromise 3
- 3. Fare Card Credential 4
- 4. Fare Card Credential and NFC Devices 5
- 5. Mobile Fare Card 5
- 6. Custom Fare Cards 10
- 7. Security 10
- 8. Intellectual Property 10
- 9. Availability Payments 11
- 10. Experience 11

Appendix 2.7 - Inspection Functionality and Devices

- 1. Interfaces, Modes, and Features 1
- 2. Device Data, Performance and Form 3
- 3. Proposal and Design Development 4
- 4. Support for Inspection Device Users 5
- 5. Testing 5
- 6. Experience 5

Attachment 1: Delivery time commitments PSR template

Appendix 2.8 - Expansion

- 1. General Requirements 1
- 2. Planned Expansions 2
- 3. Other Expansion Requirements 3
- 4. Experience 4

Appendix 2.9 - Accessibility and Language

- 1. Applicable Accessibility Law 1
- 2. Accessibility Principles 1
- 3. Accessibility Requirements for System Elements 2
- 4. Digital Accessibility 3
- 5. Retail Reload Location Accessibility 4
- 6. Maintaining Accessibility Compliance 6
- 7. Language 6
- 8. Experience 7

Attachment 1: Key Accessibility Criteria

Appendix 2.10 - Quantity Standards

| | |
|---|----|
| 1. Process Requirements | 1 |
| 2. Coverage Principle..... | 4 |
| 3. Queuing Principle | 7 |
| 4. Additional Quantity Requirements | 12 |
| 5. Title VI..... | 12 |
| 6. Experience..... | 12 |

Attachments

Appendix 2.11 - Project Management and Safety

| | |
|---|----|
| 1. Overall Project Coordination | 1 |
| 2. Ongoing Project Management | 3 |
| 3. Reporting and Documentation | 4 |
| 4. Training..... | 6 |
| 5. Safety During the Implementation Period | 7 |
| 6. Safety During Operations and Maintenance on MBTA Property..... | 10 |
| 7. Safety Hazard Management | 11 |
| 8. Drug and Alcohol-Free Workplace..... | 11 |
| 9. Safety and Security Planning and Reporting | 12 |
| 10. Experience..... | 13 |
| 11. Probability, Severity and Risk Definitions | 14 |

Attachment 1: Master Submittals List

Attachment 2: Safety Certification Program

Attachment 3: Configuration Management and Control Program

Appendix 2.12 - Vehicle Installations and Removals

| | |
|---|----|
| 1. Validation Equipment | 1 |
| 2. Mounting Locations | 3 |
| 3. Testing and Certification..... | 4 |
| 4. Vehicle Availability and Installation Locations..... | 5 |
| 5. Materials and Workmanship | 7 |
| 6. Flammability, Smoke Emission and Toxicity..... | 13 |
| 7. Removal of Existing System Fareboxes | 15 |
| 8. Experience..... | 17 |

Appendix 2.13 - Plans and Specifications for DB Installation Work

| | |
|--|---|
| 1. Preliminary DB Plans and Specifications | 1 |
| 2. Complete DB Plans and Specifications | 7 |

| | |
|---|----|
| 3. Process Requirements | 14 |
| 4. DB Plans and Specification Inclusions and Assumptions..... | 16 |
| 5. Additional DB Work..... | 19 |
| 6. Experience..... | 19 |

Attachment 1: MBTA Standard Construction Specs

Appendix 2.14 - Procurement and Execution Support for DB Installation Work

| | |
|--|---|
| 1. DB Installation Work Procurement..... | 1 |
| 2. DB Contract Administration | 2 |
| 3. Provision of System Elements and Coordination of Implementation Work with DB Installation Work | 3 |
| 4. DB Installation Work Execution and Closeout Oversight | 3 |
| 5. Experience..... | 5 |

Appendix 2.15 - Retail

| | |
|--|---|
| 1. Optional Use of Retail Reload Locations | 1 |
| 2. Management of Retail Reload Locations..... | 1 |
| 3. Point of Sale Terminal Integration..... | 2 |
| 4. Retail Functionality..... | 2 |
| 5. Administrative Point of Sales | 3 |
| 6. Future Features..... | 4 |
| 7. Experience..... | 4 |

Appendix 2.16 - Functional and Performance Testing

| | |
|--|----|
| 1. Testing Protocol | 1 |
| 2. Phases..... | 3 |
| 3. Testing Outcomes | 4 |
| 4. Demonstrating Compliance with Functional Requirements | 6 |
| 5. Demonstrating Compliance with Non-Functional Requirements | 7 |
| 6. Demonstrating and Improving Usability of the System..... | 8 |
| 7. Data Validation | 10 |
| 8. Proposal | 10 |

APPENDIX 2.3

CUSTOMER-FACING DEVICES

The Systems Integrator shall provide, as part of the System, Devices through which Users may Validate Fares and other entitlements, purchase Products, and access Transportation Services, including Gates, Fare Vending Machines, and Validators (“Customer-Facing Devices”). Readers are not Customer-Facing Devices. All Customer-Facing Devices shall comply with the requirements in this Appendix 2.3 and all other Contract Standards. Except where stated otherwise, requirements in this Appendix 2.3 apply to all Customer-Facing Devices.

Customer-Facing Devices shall focus on the needs of Users by making their interaction with the fare collection system as simple as possible. Customer-Facing Devices must create a system which makes it easy for the User to pay, is Accessible to all Users, minimizes fare evasion, is highly reliable, and is resistant to damage or degradation. The Customer-Facing Devices will be the primary means of interacting with the system by Customers, and therefore shall serve as a good representative of the MBTA’s commitment to customer service.

The Proposal shall include a general explanation of the Proposer’s approach to achieving the objectives and satisfying the requirements described in this Appendix 2.3. [PSR: Customer-Facing Devices general approach]

Table of Contents

1. References and Standards 3
1.1 Safety and Regulatory Agency Standards 3
1.2 Regulatory Standards 4
1.3 Guidelines 4
1.4 Accounting for Transition Period 4
2. General Requirements 4
2.1 Location-Device Interface 4
2.2 General Requirements for Information and Demonstration 5
2.3 Role of Other Documents and Rationale 6
3. Requirements for All Customer-Facing Devices 6
3.1 Regulatory Requirements 6
3.2 General Requirements 7
3.3 Physical Requirements 10
3.4 Data Storage and Transmission Requirements 11
3.5 Environmental Requirements 12
3.6 Maintainability Requirements 12
3.7 Safety Requirements 14
3.8 Security Requirements 14
3.9 Firmware Requirements 15
3.10 Audio Requirements 18
3.11 Style Requirements 19
3.12 Usability Requirements 20
3.13 Label Requirements 22

| | | |
|-----|---|----|
| 4. | Process, Design Approach, and Operation and Maintenance Approach Requirements | 24 |
| 4.1 | General Requirements | 24 |
| 4.2 | Testing, Certifications, Tools, Data Formats, and Keys..... | 26 |
| 4.3 | Testing Use of System Elements Installed Among AFC 1.0 Equipment..... | 29 |
| 4.4 | Design Review | 30 |
| 5. | Gate-Specific Requirements | 31 |
| 5.1 | General Requirements | 31 |
| 5.2 | Physical Requirements | 39 |
| 5.3 | Interface Requirements..... | 43 |
| 5.4 | Data Definition and Transmission Requirements..... | 46 |
| 5.5 | Installation and Acceptance Requirements | 47 |
| 5.6 | Operation and Maintenance Requirements | 47 |
| 5.7 | Safety Requirements..... | 49 |
| 5.8 | Audio Requirements..... | 50 |
| 6. | Fare Vending Machine Requirements | 50 |
| 6.1 | General FVM Requirements | 50 |
| 6.2 | FVM Functional Requirements | 51 |
| 6.3 | FVM Usability Requirements | 53 |
| 6.4 | FVM Payment Requirements | 56 |
| 6.5 | FVM Security Requirements..... | 58 |
| 6.6 | FVM Environmental Requirements | 59 |
| 6.7 | FVM Audio Requirements | 59 |
| 6.8 | FVM Screen Requirements | 62 |
| 7. | Validator Requirements..... | 63 |
| 7.1 | General Validator Requirements | 63 |
| 7.2 | Station Validator Requirements | 64 |
| 7.3 | Vehicle Validator Requirements | 64 |
| 8. | Gate Implementation Options..... | 65 |
| 8.1 | Accounting for Existing AFC 1.0 Gates Types..... | 66 |
| 8.2 | Gate Option 1: Complete Gate Replacement | 67 |
| 8.3 | Gate Option 2: New Peripheral Controller with New Enclosure/Mechanicals/Motor | 68 |
| 8.4 | Gate Option 3: New Peripheral Controller..... | 69 |
| 8.5 | Gate Option 4: Upgrading Existing Gates – Legacy Peripheral Controller | 71 |
| 8.6 | Second Stage Work for Gate Option 2 and 3 | 74 |
| 8.7 | Second Stage Work for Gate Option 4..... | 76 |
| 9. | Experience | 77 |

1. References and Standards

1.1 Safety and Regulatory Agency Standards

The standards identified in this Section 1.1 are each referenced and incorporated herein in their entirety, except that where only specific sections or subsections are identified, only those sections or subsections are applicable.

- 1.1.1 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design
- 1.1.2 FTA ADA Circular
- 1.1.3 2017 Section 508 ICT Standards
- 1.1.4 CISPR 22 Ed. 6.0 b:2008, Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
- 1.1.5 CISPR 24 Ed. 2.1 b:2015, Information technology equipment – Immunity characteristics – Limits and methods of measurement
- 1.1.6 Code of Federal Regulations – 47 CFR 15:2016 – Subpart B, Unintentional Radiators
- 1.1.7 IEC-60529 Ed. 2.2 b:2013 – Degree of protection provided by enclosures
- 1.1.8 IEC-61000-4-2 Ed. 2.0 b:2008 – Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test
- 1.1.9 IEC-61000-4-3 Ed. 3.2 b:2010 – Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test
- 1.1.10 IEC-61000-4-4 Ed. 3.0 b:2012 – Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test
- 1.1.11 IEC-61000-4-5 Ed. 3.0 b:2014 – Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test
- 1.1.12 IEC-61000-4-6 Ed. 4.0 b:2013 – Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
- 1.1.13 IEC-61000-4-11 Ed. 2.0 b:2010 – Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests
- 1.1.14 ISO/IEC 27002:2013 – Information technology Security techniques Code of practice for information security controls
- 1.1.15 IEC 62836-1:2014 – Audio/video, information and communication technology equipment – Part 1: Safety requirements
- 1.1.16 IEC 60950-21:2003 Information Technology Equipment – Safety – Part 21: Remote Power Feeding
- 1.1.17 IEC 60950-22:2016 Information Technology Equipment – Safety – Part 22: Equipment to be Installed Outdoors
- 1.1.18 IEC 60950-23:2005 Information Technology Equipment – Safety – Part 23: Large Data Storage Equipment
- 1.1.19 NIST SP 800-55 Rev 1:2008 – Performance Measurement Guide for Information Security

- 1.1.20 NFPA 70-2011 – National Electrical Code
- 1.1.21 NFPA 101b-2002 Code for Means of Egress for Buildings and Structures
- 1.1.22 NEMA 250-2003 – Enclosures for Electrical Equipment (1000 Volts Maximum)
- 1.1.23 NESC-2012 – National Electrical Safety Code

1.2 Regulatory Standards

The standards identified in this Section 1.2 are not referenced in their entirety, but only to the specific sections or subsections identified in the text below.

- 1.2.1 MIL-STD-810G(w/CHANGE-1):2014 – Environmental Engineering Considerations and Laboratory Tests.
- 1.2.2 8th Edition Base Massachusetts Building Code (2009) and related MBTA Design & Construction Standards
- 1.2.3 Title VI Statute, 42 U.S.C §§ 2000d – 2000d-7
- 1.2.4 ANSI/BHMA A156.10-2005, American National Standard for Power Operated Pedestrian Doors
- 1.2.5 UL 325, Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems
- 1.2.6 FIPS 140-2
- 1.2.7 IEC 60812:2006 Analysis Techniques for System Reliability – Procedures for Failure Mode and Effects Analysis (FMEA)

1.3 Guidelines

The guidelines identified in this Section 1.3 are referenced and incorporated herein in their entirety.

- 1.3.1 APTA SS-SIS-RP-007-10 Crime Prevention Through Environmental Design (CPTED) for Transit Facilities

1.4 Accounting for Transition Period

In implementing the requirements of this Appendix 2.3 and preparing the DB Plans and Specifications, the SI shall fully account for the Transition Period, including as needed by: (a) having multiple rounds of Device installations at each Location and on each Vehicle to gradually build up quantities and maintain compliance throughout the Installation with the requirements of Appendix 2.9, (b) applying a phased approach to the use and removal of AFC 1.0 Equipment to achieve compliance with the requirements for the System, and (c) replacing various components of the existing AFC 1.0 Gate equipment during Installation in accordance with all requirements of this Project Agreement. All risk associated with analyzing and selecting approaches to these design and implementation challenges, within the constraints set out in this Appendix 2.3 and this Project Agreement, is allocated to the SI.

2. General Requirements

2.1 Location-Device Interface

2.1.1 Anticipating Environmental Conditions and Human Interaction

The Customer-Facing Devices shall be designed and implemented to account for the environmental conditions of, and human interaction expected at, the Locations at and the Vehicles on which the Customer-Facing Devices will be installed. In designing Customer-

Facing Devices, the SI shall consider other major urban transit systems with similar attributes. The SI's design and implementation must account for such factors as:

- 2.1.1.1 "Railway" (steel) dust exposure;
- 2.1.1.2 Wind, pollutants, precipitation;
- 2.1.1.3 Varying light conditions (some Stations open to direct sunlight, others are comparatively more dark);
- 2.1.1.4 Varying humidity levels and potential condensation;
- 2.1.1.5 Varying temperatures (some Stations are more exposed to weather conditions than others);
- 2.1.1.6 Potential for liquid ingress;
- 2.1.1.7 A "noisy" electrical power environment (including power loss) associated with electromagnetic interference;
- 2.1.1.8 Non-level physical infrastructure, including uneven floors and ground at installation Locations and on Vehicles; and
- 2.1.1.9 Exposure to heavy use and User contact, including Vandalism.

2.2 General Requirements for Information and Demonstration

2.2.1 The Proposal shall include a conceptual design with detailed information about the proposed Devices to be used to fulfill these Customer-Facing Device requirements.

2.2.1.1 The conceptual design for Customer-Facing Devices shall include as needed:

- 2.2.1.1.1 Representative photographs;
- 2.2.1.1.2 Representative specifications;
- 2.2.1.1.3 Representative dimension information and sketches;
- 2.2.1.1.4 Development history and versions;
- 2.2.1.1.5 Device Variants, including an explanation of why variations have been proposed and the differences between Variants;
- 2.2.1.1.6 A description of usability and Accessibility considerations in the design of the Device;
- 2.2.1.1.7 A description of any wiring required to provide access to power and Communications Networks to Fare Vending Machines at Locations both in Stations and outside of Stations;
- 2.2.1.1.8 Existing deployments of representative devices by agency and with quantities, by Variant and version; and
- 2.2.1.1.9 Indication of how and why the SI would alter or replace any elements, subcomponents or functionalities of the representative devices for purposes of the Project.

[PSR: Proposed Gates] [PSR: Proposed Fare Vending Machine] [PSR: Proposed Validator]

2.2.1.2 Some requirements in this Appendix 2.3 require the SI to explain its approach to meeting the requirement. [PSR: Approach to meeting specific requirements of Customer-Facing Devices]

2.2.2 As part of the Technical Proposal evaluation, the SI shall set up a demonstration facility at a location provided by the SI within the US or Canada. The demonstration shall include at least one representative device for each proposed Customer-Facing Device (including each

Variant) for a period of at least one (1) full day. The date of such demonstration will be provided by the MBTA, but such date will fall within the timeframe specified in the Procurement Schedule set forth in Section 3.3.1 of the RFP. Representatives of the SI shall be available to demonstrate such devices to the MBTA field team. Such demonstration shall include all functionality already available in existing deployments and shall include an explanation of how such functionality will be tailored to or otherwise satisfy the MBTA's Technical Requirements relating to the Customer-Facing Devices). The SI shall demonstrate that the Customer-Facing Devices are accessible by all persons, including those persons with disabilities; account for the diversity of real-world use cases at the MBTA to address both device access and interaction; and support MBTA representatives in simulating interactions with the devices, in both standard and non-standard ways. This demonstration will be part of the Technical Proposal evaluation. [Technical Proposal Evaluation: Demonstration]

- 2.2.3 During the Technical Proposal evaluation, Proposers shall participate in an interview. The interview shall include a presentation by the Proposer to the evaluation committee addressing the Proposer's approach to Customer-Facing Devices, including a description as to how the devices the SI has in existing deployments will be modified to meet the Technical Requirements. The Proposer is not required to bring devices to Boston for the interview. The MBTA will provide agenda requirements for this presentation by Addendum. See Section 5.7 of the RFP for additional information about the presentation and interview. [Technical Proposal Evaluation: Proposer interview]

2.3 Role of Other Documents and Rationale

The requirements in Section 3, below, refer to local, national, and international standards when possible. Where the MBTA's rationale for the requirement is stated, it is intended for the informational purposes of the Proposers and should not be viewed as limiting the requirement in any respect. The SI will be solely responsible for complying with each requirement and demonstrating compliance to the MBTA.

3. Requirements for All Customer-Facing Devices

3.1 Regulatory Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 3.1-1 | Without limiting any Change in Law or Change in Payment Industry Standards relief as and to the extent provided under this Project Agreement, all Customer-Facing Devices installed prior to the Full Service Commencement Date shall comply with the versions of the standards listed in Sections 1.1, 1.2, and 1.3 of this Appendix 2.3 most recently adopted as of six (6) months before the date that Pilot Phase 1 begins. | | |
| 3.1-2 | Customer-Facing Devices shall comply with Applicable Accessibility Law. | | |

3.2 General Requirements

3.2.1 Electronics

| ID | Description | Rationale | Notes |
|---------|---|---|-------|
| 3.2.1-1 | Each sub-assembly of a Customer-Facing Device in the System that contains a microprocessor shall include a watchdog timer (either a hardware timer or a separate microprocessor/CPU that automatically generates a system reset if the main program neglects to periodically service it), and must track and report any service issues, disruptions, or resets to the Automated Monitoring Subsystem, and the SI shall treat any instances of this occurring as a Performance Failure as described in Appendix 8. | To reset the processors/etc. in each Customer-Facing Device if one hangs. | |
| 3.2.1-2 | Customer-Facing Device modules with an intelligent controller shall contain their part number, revision number, and serial number accessible by the Automated Monitoring Subsystem. Serial numbers may be manually populated into the AMS by the SI for modules of the Limited-Functionality FVM, provided the SI ensures accuracy and updating of these values in the Monitoring Plan required in Appendix 4.6. | Maintainability | |
| 3.2.1-3 | The Customer-Facing Device shall indicate to the network when it is rebooted/reset. | If there's a systemic problem the operator "fixes" with device resets, the network needs to be made aware that this is happening as it indicates the Device requires service. | |
| 3.2.1-4 | All System Elements used to fulfill the requirements for Customer-Facing Devices set forth in this Appendix 2.3 shall be contained within and isolated to the Customer-Facing Device and Back-End System Elements and shall not be contained within a Reader, except as provided in Appendix 3.2. | To allow for Readers that incorporate display screens, sounds, etc. | |

3.2.2 Sensors/Actuators

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--|
| 3.2.2-1 | Each Customer-Facing Device in the System shall include at least 1 ambient temperature sensor. | The System must be able to monitor its temperature in order to communicate a potential failure due to temperature. | |
| 3.2.2-2 | Each Customer-Facing Device enclosure in the System shall include a method to detect the device being opened when not in an authorized maintenance mode. | To determine if someone is trying to tamper with the System. | The preferred option (especially for fixed location Devices) is a mechanical assault sensor. |

3.2.3 Displays

The Proposal shall provide a description of the proposed display technology for each Customer-Facing Device. [PSR: Proposed Gates] [PSR: Proposed Fare Vending Machine] [PSR: Proposed Validator]

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--------------|
| 3.2.3-1 | All User-viewable Customer-Facing Device displays shall be viewable and the content on the displays readable and discernable under all light conditions found in the Location or Vehicle where the Device is placed. | Some will be in underground Stations with poor lighting, others could be in direct sunlight. | |
| 3.2.3-2 | All User-viewable displays shall have horizontal and vertical viewing angles sufficient that the content on the display can be read and discerned from all angles at which Users can see the Device, except for displays involved in PIN entry and except when a privacy mode is activated. | To help with User flow. For example, User can see Gate is in/out of service before walking right up to that particular Gate. | |
| 3.2.3-3 | User-viewable displays shall be readable from a seated eye height of forty (40) inches above finished floor. | | |
| 3.2.3-4 | When a Customer-Facing Device is operating in offline mode, it shall not provide any indication of offline status to a User except as described in section 3.2.3-4.1. | To protect against Fare evasion attempts. | |
| 3.2.3-4.1 | If the offline status impairs the User's ability to perform functions at the Device, the User shall be notified which features are unavailable. | To support a good customer experience. | |

3.2.4 Clocks

The Proposal shall explain the time synchronization process and how it will work in various scenarios of system load, network traffic, and communications interruptions. [PSR: Time synchronization process]

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|---|
| 3.2.4-1 | Each Customer-Facing Device shall have an internally maintained time and date clock that is independent of the network time. | Required to date and time stamp transactions. | |
| 3.2.4-2 | Each Customer-Facing Device clock shall be synchronized with an authoritative time source shared by the rest of the System within 1 second at all times. | Inadequate or poorly designed clock synchronization puts data integrity and reconciliation at risk. | |
| 3.2.4-2.1 | Each Customer-Facing Device shall be able to gracefully recover from a timing variance outside of the requirements of this Section 3.2.4 with minimal interruption of service during the recovery, and, at a minimum, during testing (as described in Appendix 2.16), the System shall be tested with at least ten (10) seconds variance across the System Elements most sensitive to timing issues, and all Technical Requirements shall still be successfully achieved in that state. | | |
| 3.2.4-3 | The internally maintained clock shall have drift less than 5 seconds per day when offline. | Internal clock must remain sufficiently accurate while operating off-network during outages or otherwise, when it cannot sync its clock with the main server. | Equates to a drift of a little more than 50 ppm for the internal clock. |
| 3.2.4-4 | All Customer-Facing Device clocks shall be able to be synchronized when the Device reconnects to the network, and while connected shall use a network provided time source application. | To keep the various Device clocks in sync to minimize the chances of clock issues between a FVM and a Gate or Validator introducing unnecessary delay to a User's ability to enter a Vehicle/Station. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 3.2.4-5 | The clocks in the Customer-Facing Devices shall be able to survive a power interruption of up to 48 hours. | So the Device can continue to provide reliable date/time stamps even without a network connection. | |

3.3 Physical Requirements

3.3.1 Enclosure Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 3.3.1-1 | The electronics in each Customer-Facing Device shall be protected from water and dust ingress to the maximum extent in all reasonably expected conditions, as further described in Section 2.1.1 of this Appendix 2.3. The Proposal shall include a description of the Proposer's approach to hardening the Customer-Facing Devices against weather, water ingress, and dust ingress, and its proposed methods of testing this. [PSR: Approach to meeting specific requirements of Customer-Facing Devices] | Protect against water and rail dust ingress. Rail dust must be prevented from interfering with operation of the sensors of a Customer-Facing Device. | |
| 3.3.1-2 | Customer-Facing Devices shall provide sufficient internal air circulation and air ventilation to meet motor and module temperature specifications. | To avoid overheating conditions on modules and motors. | |
| 3.3.1-3 | Upon entering into Revenue Service, all electronic components or active connectors not protected in a sealed envelope with an IP rating of at least IPX7 of a Customer-Facing Device shall be mounted in their enclosures at least four (4) inches above the bottom of the enclosure. | To prevent damage to electronics against immersion during flood conditions, as some Stations do flood. | |
| 3.3.1-4 | The Customer-Facing Device enclosures shall be protected against corrosion as specified in reference 1.2.5 (UL325), section 11. | | |

3.3.2 Height

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 3.3.2-1 | The design of all Customer-Facing Devices must locate all operable parts between thirty-six (36) and forty-eight (48) inches above the finished floor. Operable parts include, among others, touch/tap targets, audio controls/jacks, touch screens, buttons, cash and coin slots, Payment Card readers, etc. | Accessibility | |
| 3.3.2-2 | Fare Card, receipt and change return may be at a height less than thirty-six (36) inches provided it is at least fifteen (15) inches above the finished floor. | | |

3.4 Data Storage and Transmission Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|--------------|
| 3.4-1 | <p>Customer-Facing Devices shall log temperature sensor data, runtime diagnostic data, and all error logs in a non-volatile memory system.</p> <p>Such logging is required for all Customer-Facing Devices except the Limited-Functionality FVM, for which the logging is preferred. For the Limited Functionality FVM, the SI may propose to manually monitor temperature in various operating conditions and in the event of any Performance Failure and provide reports in accordance with the Monitoring Plan.</p> <p>If the SI proposes to manually monitor temperature in such cases, the Proposal shall describe its approach to manual monitoring, including an inspection schedule, sampling rates and proposed reporting format. [PSR: Device maintenance]</p> | Detailed error reporting must persist through loss of network connection and loss of power. | |
| 3.4-2 | <p>The memory system referred to in Section 3.4-1 shall have an identical non-volatile mirrored backup memory system, or an alternative approach to meeting the same objective and ensuring zero Data loss.</p> <p>If an alternative is proposed, the Proposal shall include a description of the alternative approach to ensure zero Data loss. [PSR: Approach to meeting specific requirements of Customer-Facing Devices]</p> | Mechanical and electrical redundancy. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|--------------|
| 3.4-3 | All Data-storage systems shall use solid-state memory devices. | Minimized size and delays, maximized reliability. | |
| 3.4-4 | All Data-storage systems shall be removable or downloadable. | | |

3.5 Environmental Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 3.5-1 | Each Customer-Facing Devices shall pass the solar radiation tests representative of worst-case solar loads for the MBTA Service Area described in reference 1.2.1 prior to the Installation Commencement Date. | Ensures the Gates can handle UV exposure. | |
| 3.5-2 | All Customer-Facing-Devices installed outdoors shall comply with the standard in reference 1.1.17. | Information technology equipment installed outdoors. | |
| 3.5-3 | The Customer-Facing Devices shall operate between an ambient range of -25 to +55 degrees Celsius. | Covers MBTA environments. | |
| 3.5-4 | The Customer-Facing Devices shall be capable of operating after being stored at temperatures between -30 to +70 degrees Celsius. | Covers MBTA environments. | |
| 3.5-5 | The Customer-Facing Devices shall operate when exposed to a relative humidity of 95% without condensation at 35 degrees Celsius. | | |
| 3.5-6 | The Customer-Facing Devices shall have a flammability rating of at least UL94V-0. | | |

3.6 Maintainability Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|----------------------|--------------|
| 3.6-1 | Any System Element that requires lifting for on-site maintenance shall weigh less than fifteen (15) kilograms, not including consumables. | Ease of maintenance. | |
| 3.6-1.1 | Any System Element that may require lifting for transportation off-site for maintenance shall weigh less than twenty-three (23) kilograms. | Ease of maintenance. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|---|
| 3.6-2 | All electrical connections between assemblies and sub-assemblies shall refrain from requiring soldered connections except for COTS sub-assemblies where this would force the use of custom parts. | To allow for easier maintenance than directly soldered connections. | The SI must show that the maintenance timing requirements in this document will be met anywhere COTS sub-assemblies with soldered connections are used. |
| 3.6-3 | All plug-in connectors shall be equipped with strain-relief. | Prevent wear and tear on the cabling. | |
| 3.6-4 | Each Customer-Facing Device shall have a unique identification number that can be electronically scanned or read. Any tools required to scan/read shall be provided as part of Handback Requirements. [CDRL: Scanning/reading method] [CDRL: Special tools required to support scanning/reading method] | System maintainability and asset tracking | |
| 3.6-5 | Customer-Facing Devices shall include a: <ul style="list-style-type: none"> ▪ non-proprietary connection to an SI-provided maintenance tool reasonably acceptable to the MBTA; or ▪ a local maintenance tool installed on the Customer-Facing Device only authorized to authenticated agents with the right to use the maintenance tool. Such a connection or tool shall be secured, Mutually Authenticated, and isolated from all PII as described in Appendix 3.1A, such that unauthorized use is prevented, and nothing connected to the Device can use the tool or connection to cause harm to the Customer-Facing Device or cause any Incident. | To aid in testing the System, local printouts, firmware upgrades, manual Tap retrieval. | For example, a USB port, SD card or wireless connection. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 3.6-5.1 | If the Device must be removed from Revenue Service in order to access the connection to the maintenance tool, the status of the Device shall be tracked, and the SI shall install a replacement Device so as to ensure there is no interruption to Revenue Service. If the proposed maintenance tool requires the Device to be removed, the Proposal shall describe the approach to Device removal for maintenance. [PSR: Device maintenance] | | |
| 3.6-6 | The time required to remove and replace any part of a Customer-Facing Device shall be less than thirty (30) minutes. | Limiting Device downtime during maintenance. | |

3.7 Safety Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|--|
| 3.7-1 | All Customer-Facing Device hardware enclosures, chassis, assemblies, panels, switch boxes, terminal boxes and similar enclosures shall be protectively grounded in compliance with reference 1.1.15. | Safety; prevents a potential from building up on conductive material in the Customer-Facing Device. | Reference 1.1.15 contains information on requirements for protective earth conductors. |
| 3.7-2 | Customer-Facing Devices shall be designed and constructed to be safe to the public and the environment both under normal operating conditions, and in the event of equipment failure. | | |
| 3.7-3 | Customer-Facing Devices shall comply with the safety requirements in Appendix 2.11. | | |

3.8 Security Requirements

The Proposal shall include a description of the security features of each type of Customer-Facing Device. [PSR: Proposed Gates] [PSR: Proposed Fare Vending Machines] [PSR: Proposed Validators]

3.8.1 Physical Security Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--------------|
| 3.8.1-1 | Access to the interior of a Customer-Facing Device shall be restricted to authorized Users through locks and other mechanisms to ensure security. | Devices contain sensitive information. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--------------|
| 3.18.1-2 | All access or attempts to access the interior of a Customer-Facing Device shall be logged by the System and available in the Automated Monitoring Subsystem. | | |

3.8.2 Data Security Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--------------|
| 3.8.2-1 | Unauthorized persons shall be prevented from accessing Data from Customer-Facing Devices, at least to the level outlined in reference 1.2.6 and Appendix 3.1 and Appendix 3.1A. The scope of System Elements associated with the Customer-Facing Devices to which the requirements of reference 1.2.6 apply shall be determined as set forth in Appendix 3.1. | There are multiple ports in the system for authorized users to download/access data. There must be protection beyond the locked doors of the enclosure. | |
| 3.8.2-2 | Customer-Facing Devices shall comply with the requirements set forth in Appendix 3.1 and Appendix 3.1A. | Provide for the ability to restrict access to PII. | |
| 3.8.2-3 | Customer-Facing Devices shall be tamper proof, and if any Devices are determined by the QSA to be within scope of Payment Industry Standards which require data destruction, shall have a mechanism to implement such data destruction in accordance with the requirements set forth in Appendix 3.1. | | |

3.9 Firmware Requirements

3.9.1 General Firmware Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--------------|
| 3.9.1-1 | Customer-Facing Devices shall utilize a standards-based, reliable, non-proprietary Data transmission protocol. No proprietary Data communication protocol may be used. The Proposal shall describe the Data transmission protocol for Customer-Facing Devices. [PSR: Approach to meeting specific requirements of Customer-Facing Devices] | Data transmission reliability | |
| 3.9.1-2 | Customer-Facing Devices shall be capable of accepting upgrades to operating systems and application of operating system patches. | Lifecycle maintenance and security standards compliance | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|---|
| 3.9.1-3 | The failure mode and effects analysis (FMEA) provided by the SI (defined in requirement 4.2-4) shall confirm that all emergency commands (for example, fire alarm signals, remote Gate open commands) have the highest priority and are not interruptible by other Device activities. | Safety consideration, an emergency command cannot be interrupted by a non-emergency command (for example, a User is interacting with a Device at the same time, the emergency function shall take precedence). | |
| 3.9.1-4 | Customer-Facing Devices shall actively monitor their internal temperatures. They shall report this information to the Automated Monitoring Subsystem while Configurable thresholds (low and high) have been exceeded. The SI shall configure alerting thresholds. | Could indicate a Problem that would require maintenance. False alarms must be minimized through well-defined alerting thresholds. | |
| 3.9.1-5 | All Software downloaded for use in any Device shall be validated and Mutually Authenticated before use. | To avoid a fault or security breach. | This includes operating systems and Data used to implement Configuration. |
| 3.9.1-6 | Anytime an interlock or mechanical assault sensor is tripped, the Customer-Facing Device shall sound an alarm. | To discourage a non-authorized user from opening a Gate. | |
| 3.9.1-7 | The event in requirement 3.9.1-6 above shall result in a status message being sent to the Automated Monitoring Subsystem in a secure manner. | To log unauthorized entries into Device interiors. | |
| 3.9.1-8 | The duration and volume of the alarm in requirement 3.9.1-6 shall be Configurable. | | |
| 3.9.1-9 | Customer-Facing Devices shall be capable of displaying Configurable messages to Users. | | |
| 3.9.1-10 | Customer-Facing Devices shall refrain from displaying or annunciating any Personally Identifiable Information. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 3.9.1-11 | Customer-Facing Devices shall be capable of displaying Products held in the Account, warning of low or negative Account Balance, and status information for the Account associated with a presented Credential, and the content of such display shall be Configurable by the MBTA. | | |
| 3.9.1-12 | Customer-Facing Devices should, to the extent possible, display upon Tap: the amount of the Fare to be charged for the trip, the type of Fare (including Best Value Fare, Transfer Fare, Extension Fare), as defined in Appendix 3.7), and the Account Balance. The Proposal shall describe the extent to which it is possible to display Fare on Tap within the parameters of the Technical Requirements. [PSR: Approach to meeting specific requirements of Customer-Facing Devices] | | |

3.9.2 Diagnostics Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--------------|
| 3.9.2-1 | The SI shall provide the MBTA with a documented list of error codes generated by Devices and the meaning of each, and an indication of which are monitored in the Automated Monitoring Subsystem and which represent alerts. [CDRL: Error code list] | | |
| 3.9.2-2 | The SI shall provide the MBTA with all diagnostic software and any tools needed to use the Software for all Devices at the times required in accordance with the Project Agreement. [CDRL: Diagnostic software and required tools] | | |
| 3.9.2-3 | The SI shall provide the MBTA with all Documentation and procedures related to the diagnostics for Customer-Facing Devices at the times required in accordance with the Project Agreement. [CDRL: Diagnostic Documentation and procedures] | | |

3.10 Audio Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|---|
| 3.10-1 | The audio output level of each Customer-Facing Device shall be Configurable. | Different ambient noise levels in different Locations and on Vehicles. | This can be done through either a physical volume adjustment on the Device or via Software. |
| 3.10-1.1 | All Customer-Facing Devices except for Limited-Functionality FVMs shall contain Configurable automatic gain control that can automatically and dynamically adjust the Device output volume to account for amplitude variation in the audio source. | To account for differing volumes among audio files the Device will playback without requiring repeated volume toggling by a technician. | |
| 3.10-2 | The output volume of each Device shall be Configurable remotely, by Device Type and Variant. | For example, to avoid the need to open a Device at a Station to adjust the volume on other Devices in that Station. | |
| 3.10-3 | The Customer-Facing Device audio controller shall be able to play a wide range of standard format audio files and must be Configurable by the MBTA. The SI shall identify the accepted formats during the preliminary design review. [CDRL: Accepted formats for audio files] | The System must have audio cues for visually impaired users. | |
| 3.10-4 | The Customer-Facing Devices shall be able to drive frequencies in the range of 300Hz to 17kHz at a Configurable volume up to 75 DBspL. | To cover close to the full audible range, not just voice. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 3.10-5 | <p>The audio output component of a Customer-Facing Device shall provide a method to verify that it is connected and functioning correctly, and this must be monitored and available in the Automated Monitoring Subsystem. Alternatively, the SI may propose to manually monitor audio outputs and provide reports in accordance with the Monitoring Plan.</p> <p>If the SI proposes to manually monitor audio outputs, the Proposal shall describe its approach to manual monitoring of audio output, including an inspection schedule, sampling rates and proposed reporting format. [PSR: Device maintenance]</p> | To detect issues related to audio outputs without requiring an issue to be reported. | |
| 3.10-6 | Audio produced by Customer-Facing Devices to convey success or failure to the User shall be the same across different Devices and Variants. | To support a consistent user experience. | |

3.11 Style Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|-------------------------|--|
| 3.11-1 | The appearance of text, icons and images used in Customer-Facing Devices shall align with the MBTA Tech Style Guide and the AFC 2.0 Brand Style & Use Guide. | MBTA brand consistency. | The MBTA Tech Style Guide is a living document published at beta.mbta.com/style_guide (when the beta site goes live this URL will change to www.mbta.com/style_guide). |
| 3.11-2 | Any colors used on Customer-Facing Devices shall be drawn from the AFC 2.0 Brand Style & Use Guide, MBTA Tech Style Guide or be complementary to those colors. Wherever color is used to represent MBTA modes or lines, the color shall match the color shown in the MBTA Tech Style Guide. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|-----------------------------|
| 3.11-3 | Use of the MBTA logo shall comply with logo guidelines in the MBTA Tech Style Guide and Attachment 1 (MBTA Branding Guidelines). | | |
| 3.11-4 | The language used for messages on Customer-Facing Devices shall: <ul style="list-style-type: none"> ▪ align with the tone described in Attachment 1 (MBTA Branding Guidelines) and ▪ follow the content style guide in the MBTA Tech Style Guide. | | See note in Section 3.11-1. |
| 3.11-5 | The SI shall provide one complete refresh of the visual design of Customer-Facing Device display content during the Term, with the exact timing of that refresh to be at MBTA direction and completed by the SI within 90 days of MBTA notice. The MBTA may, for the refresh, substitute new documents in place of the MBTA Branding Guidelines, the MBTA Tech Style Guide, and the AFC 2.0 Brand Style & Use Guide. | | |

3.12 Usability Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--------------|
| 3.12-1 | Customer-Facing Devices shall be user friendly; that is, simple to use, predictable, easy to understand, conveniently located, and in accordance with other applicable human engineering principles. | | |
| 3.12-2 | Customer-Facing Devices shall use symbols and non-word sounds for as many uses as is practicable. | To avoid excessive enunciated text and user confusion. | |
| 3.12-3 | Customer-Facing Devices shall display messages to communicate instructions, status and error messages. Messages shall be: <ul style="list-style-type: none"> ▪ Visible, conspicuous, and highly noticeable. ▪ Written in plain language and easy to understand. ▪ Precise and polite. ▪ Provide constructive advice on how to fix the error (when appropriate). | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--|
| 3.12-4 | <p>Customer-Facing Devices shall be designed to help prevent errors and provide sufficient tolerance for error. When errors do occur, the Devices shall make error situations less unpleasant for Users by:</p> <ul style="list-style-type: none"> ▪ Preserving as much of the User’s work as possible. ▪ Minimizing the effort required to fix errors. ▪ Supporting options to undo or redo or an input. ▪ Minimizing the impact on other Users. | | |
| 3.12-5 | The SI shall demonstrate the usability of all Customer-Facing Devices during user testing, during Pilots, and during the Transition Period and address usability issues, including by changing the User Interface, altering the design and modifying screen flows. | | |
| 3.12-6 | The Proposal shall provide a one page description (“Usability Case Study”) of usability improvements previously undertaken with a broad user group for one of the proposed Customer-Facing Devices. The Usability Case Study shall include a description of the process for identifying the improvements and examples of changes made to the device to improve usability. [PSR: Usability case study] | | |
| 3.12-7 | User Interfaces shall, to the extent possible, maximize the extent that the user experience matches User expectations by supporting changes in configurations based on User Established Customizations. | To automatically adjust Devices based on what is known about the User. For example: extra time to Tap / read a Media or Payment Card, to enter required information for each type of transaction, adjust contrast controls and screen-to-text output speeds. | User Established Customizations are described in Appendix 3.8. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--------------|
| 3.12-8 | By default, all Customer-Facing Devices shall be in English and shall change to another language as described in Appendix 2.9 when (a) the User makes a selection on the FVM to change the language, or (b) Media is presented for which the associated Registered Account has a User Established Customization for another language (as described in Appendix 3.8). | | |
| 3.12-9 | If the SI proposes to deploy more than one Variant of any Customer-Facing Device, the User Interface across Variants of Customer-Facing devices shall be similar. User testing shall be repeated prior to introducing User Interface changes into Revenue Service which will have a substantial impact on Users as further described in Appendix 2.16. | | |
| 3.12-10 | Where provided, color shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. | Accessibility | |
| 3.12-11 | Customer-Facing Devices shall be capable of displaying and (where appropriate) articulating messages to notify Users of free travel in the event that Fare Policy, Configuration, or a discount (as described in Appendix 3.7) results in free travel for all Users. | | |

3.13 Label Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 3.13-1 | Instructions and graphics shall be contained on Customer-Facing Devices to clearly indicate how a User should interact with the Device. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|---|
| 3.13-2 | <p>When text is utilized on Customer-Facing Devices to label parts and provide instructions, placard labels shall be applied to the front face of the Device written in American English with both Braille and tactile text.</p> <p>Alternatively, the SI may propose to use stickers for the Braille labels. If the SI proposes to use stickers, the SI shall be responsible for maintaining the stickers, including replacement of stickers required due to Vandalism. Replacement of stickers due to Vandalism will not be eligible for the Vandalism Reserve Account described in Section 8.2 of this Project Agreement or serve as a basis for any Supervening Event relief hereunder. The SI shall provide reports in accordance with the Monitoring Plan. The Proposal shall include a plan for Braille sticker maintenance which describes the SI's approach to monitoring sticker appearance, including an inspection schedule, sampling rates and proposed reporting format. [PSR: Device maintenance]</p> | | For example, if the point of presentment is labeled as "tap card here," those words shall also be provided in braille and tactile text. |
| 3.13-2.1 | Labels shall comply with sections 703 and 707 of the ADA Standards and any others as applicable, including raised characters shall be 1/32 inch (0.8 mm) minimum above their background. | | |
| 3.13-3 | The placement of labels relative to what they are describing shall be consistent to the extent possible. | | For example, always above or to the left of what they describe. |
| 3.13-4 | Labels shall provide directional instruction through tactile arrows and Braille text. Arrow lines and heads shall be discernable from decorative lines. | So that the vision impaired Users understand what the label is referring to and do not mistake arrows for decoration on the Device. | |
| 3.13-5 | Fixed graphics shall be provided on each Gate to clearly depict and guide Users to the locations of and correct use of the Reader. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 3.13-6 | The international accessible sign shall be affixed to both sides Accessible Gates. If space allows, this label may also include symbols for Users traveling with a baby stroller and luggage. | | |

4. Process, Design Approach, and Operation and Maintenance Approach Requirements

4.1 General Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 4.1-1 | The SI shall use an established Software and Product development process to the MBTA. The Proposal shall include a description of its software and product development process. [PSR: Approach to meeting specific requirements of Customer-Facing Devices] | MBTA expects that this is an established standard operating procedure for the SI | |
| 4.1-2 | If a Device does not occupy the same space as the equipment it replaces, the DB Plans and Specifications cover any necessary repairs or refurbishments to the flooring surrounding the Device. The Proposal shall include (in the Preliminary DB Plans and Specifications described in Appendix 2.13) a description of any necessary repairs or refurbishments to the flooring surrounding a Device. [PSR: Summary of technical approach to DB Installation Work] | The flooring will need to be repaired if any space currently under Gates is left exposed by the new Gates. | |
| 4.1-3 | All components or functionally equivalent replacement components used in Devices shall be available from a second source. | | |
| 4.1-3.1 | The SI shall provide a risk analysis and mitigation plan addressing potential supply chain issues with components used in the Devices. [CDRL: Risk analysis and mitigation plan addressing potential supply chain issues] | | |
| 4.1-4 | The SI shall maintain a sufficient inventory of spare parts for Customer-Facing Devices during the Term to enable the SI to perform all required maintenance and meet all availability requirements. | SI will be responsible for System maintenance throughout the Term. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|--|
| 4.1-5 | <p>The SI shall keep on-hand enough spare parts to maintain the Customer-Facing Devices for 1 year.</p> <p>The Proposal shall include projected spare parts consumption rates. [PSR: Device maintenance]</p> <p>The SI shall update and provide that list once every six months. [CDRL: Updated spare parts consumption rates]</p> | If a part goes End of Life (EOL), this gives the SI 1 year to design in a replacement. | |
| 4.1-6 | Except as expressly provided herein in respect of the re-use of AFC 1.0 Equipment, the SI shall NOT , in the implementation of Customer-Facing Devices, use any used or remanufactured equipment from the MBTA or any other source. | To guard against Not Recommended for New Deployments / End of Life (NRND/EOL) components being used. | |
| 4.1-7 | The SI's implementation plans shall explain how the impact to Station and Vehicle throughput will be minimized during Installation. [CDRL: Implementation plan] | Important that throughput is not decreased during implementation. | Implementation plan requirements are described in Appendix 2.11. |
| 4.1-8 | For Gates, the SI shall not interfere with network connection from AFC 1.0 Gate PCs used during Installation, Pilots and the Transition Period to the Existing System back office. The SI's responsibilities in respect of the System Communications Network are set forth in Appendix 2.5. | | |
| 4.1-8.1 | The SI shall ensure that no network traffic will leak or flow between the Existing System network and the Communications Network, as further specified in Appendix 2.5. | Compliance with applicable PCI Security Standards Council (PCI-SSC) standards as described in Appendix 3.1. | |
| 4.1-9 | The SI shall perform testing in accordance with Good Industry Practice for all Customer-Facing Devices after manufacturing and prior the Installation Commencement Date. | To minimize having to take installed Gates out of service to debug issues in the field. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--------------|
| 4.1-10 | <p>The Proposal shall include a concept white paper for hands free remote gate activation, where Users would not need to physically interact with the Reader in any way to present Media for Validation. The concept shall comply with all requirements for Gates as set out in this Appendix 2.3 and shall identify:</p> <ul style="list-style-type: none"> ▪ What Media/Credential would be used? ▪ How would existing point of presentment functionality be retained to allow the Hands-Free Gate to also serve Users not using the hands-free capability? ▪ How would the approach would ensure the correct Gate opens for the correct User? ▪ How would the initial Validators will respond to technological change over time? <p>[PSR: Hands free remote gate activation concept white paper]</p> | | |
| 4.1-11 | Gate sensors shall operate for a period of at least 30 days without requiring routine maintenance. | So that the typical Station's dust/grime buildup over 30 days will not to cause the Gate sensors to fail. | |

4.2 Testing, Certifications, Tools, Data Formats, and Keys

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--------------|
| 4.2-1 | <p>Each Variant of each Customer-Facing Device shall be tested for safety by a nationally recognized testing laboratory at the SI's expense prior to the Installation Commencement Date. If a testing laboratory outside the United States is used, United States standards shall be used.</p> <p>The Proposer shall provide the MBTA with the name of the testing laboratory at the time of the Proposal. [PSR: Testing proposal]</p> | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 4.2-1.1 | Each new version of each Customer-Facing Device released shall be tested in the same manner or accompanied by an engineering change order detailing the changes and any rationale that the release does not require additional testing shall be approved by the MBTA. | | |
| 4.2-1.2 | The SI shall provide a copy of each test report at least 30 days prior to any Customer-Facing Device being installed at a Location or on a Vehicle. [CDRL: Device safety test reports]. | | |
| 4.2-2 | <p>The SI shall provide SI Interface Control Documents for all interfaces between assemblies and subassemblies in accordance with the Contract Standards. For Customer-Facing Devices that will change or be replaced between the start of Installation and the Full Service Commencement Date, the SI shall submit an SI Interface Control Document for each Variant of the Device.</p> <p>Such Documentation shall include:</p> <ul style="list-style-type: none"> ▪ All inputs and outputs for each subsystem ▪ The complete interface protocol for information travelling between subsystems of each Customer-Facing Device. ▪ All inputs and outputs for each Customer-Facing Device ▪ The complete interface protocol for information travelling to and/or from a Customer-Facing Device. <p>[CDRL: SI Interface Control Documents]</p> | | |
| 4.2-3 | The SI shall disclose all file and table formats, definitions, and defaults used in the Software at the times required in accordance with the Contract Standards. [CDRL: Software file and table formats, defaults] | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|---|
| 4.2-4 | The SI shall provide the MBTA with a FMEA for each Customer-Facing Device in keeping with reference 1.2.7. [CDRL: Failure modes and effects analysis (FMEA)] | | Field service reports can be used as a justification for proper operation for Devices that are in production and not modified in any way for the MBTA (this includes software modifications). |
| 4.2-5 | The FMEA shall address at a minimum the following safety issues (including their mitigations): <ul style="list-style-type: none"> ▪ A wheeled accessibility device becoming entrapped in the Gate doors. ▪ The Gate doors not opening quickly enough to prevent a User (including one in a wheeled accessibility device) from crashing into the doors. ▪ The potential for User injury due to contact with the Gates (no sharp edges, etc.). | FMEAs provide a final check on crucial design criteria. | The safety issues specified herein are NOT meant to be a comprehensive, but rather to give examples of the types of items that need to be in the FMEA |
| 4.2-6 | Fare evasion resistance, especially for Gates, is a critical MBTA priority and the Customer-Facing Devices shall be designed and implemented to limit fare evasion. The Proposal shall include an explanation of how the Proposer's proposed equipment and implementation (setting aside any MBTA enforcement efforts) will minimize Fare loss; the explanation should include: <ul style="list-style-type: none"> ▪ An elaboration of how the SI has addressed these issues in other projects, ▪ A description of the Gate's ability to resist and survive Vandalism attempts, ▪ Comparisons to other equipment, including the MBTA's current equipment, and ▪ Specific methods used to combat Fare loss. [PSR: Approach to Fare loss prevention] | The MBTA deals with various Fare evasion methods and the Proposal will include methods to minimize the impact of these methods. | Some examples include: extra Users piggybacking on a single transaction or standing in front of the Gates long enough to cause the Gate to go out of service. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|--------------|
| 4.2-7 | The FMEAs shall determine effects that indicate or suggest safety and Fare collection concerns, and shall be coordinated with the safety and hazard analyses required in Appendix 2.11. | | |
| 4.2-8 | The SI shall provide all SI-provided physical tools necessary to operate and maintain the Customer-Facing Devices to the MBTA at no cost at the times required in accordance with Project Agreement. [CDRL: Tools required to operate and maintain Customer-Facing Devices] | So the MBTA can have all necessary keys, keycards, cables, etc. to access and operate the System. | |
| 4.2-9 | During the Term, the SI shall be responsible for: (1) replacing any malfunctioning keys or other Credentials used to access the interior of any Customer-Facing Device, and (2) re-keying or re-programming any Customer-Facing Device that becomes inaccessible for any reason. | | |
| 4.2-10 | The SI shall demonstrate the quantified resistance of the proposed Customer-Facing Devices to horizontal and vertical impacts during the Customer Facing-Device demonstration and during testing. [Technical Proposal Evaluation: Demonstration] | To show the Devices can withstand damage from both expected usage and Vandalism attempts. | |

4.3 Testing Use of System Elements Installed Among AFC 1.0 Equipment

For those Gate Options associated with the use of AFC 1.0 Equipment:

- 4.3.1 The SI shall utilize the nationally recognized test laboratory identified in requirement 4.2-1 to certify that any component the SI (directly or by way of inclusion in the DB Plans and Specifications) adds to any AFC 1.0 Gate, and the method defined in the DB Plans and Specifications for the Installation of such components is:
- 4.3.1.1 Nationally recognized test laboratory-recognized component, tested to IEC 62368-1:2014 or equivalent, except that this does not include the ICB; and
- 4.3.1.2 Certified to ISO/IEC 27002:2013.
[CDRL: Device safety test reports for components added to AFC 1.0 Gates]
- 4.3.2 The SI shall support the MBTA in getting the modified AFC 1.0 Gate tested to (i) achieving a listing for the fare gate by a NRTL to IEC 62368-1:2014 or equivalent; and (ii) certified to CISPR 22 ED6.0 and CISPR 24 Ed2.1 or equivalent. The SI shall be responsible for:
- 4.3.2.1 Providing all requested design Documentation on the System Elements and installation methods added to the gate by the SI;

- 4.3.2.2 Providing all test Documentation related to getting System Elements and installation methods recognized by the nationally recognized testing laboratory;
- 4.3.2.3 Being available to answer any questions about System Elements and installation methods during the listing process;
- 4.3.2.4 Addressing any failures in the process of listing the modified AFC 1.0 Gate that pertain to System Elements or any installation method (including updating the DB Plans and Specifications in accordance with the provisions of this Project Agreement);
- 4.3.2.5 Covering the costs to re-perform the testing necessary to achieve nationally recognized testing laboratory listing for the modified AFC 1.0 Gates if the first test fails due to a System Element or an installation method.
[CDRL: Documentation and support for safety testing of modified AFC 1.0 Gates]
- 4.3.3 If the SI chooses to modify an AFC 1.0 Gate enclosure to accommodate any System Elements, the nationally recognized testing laboratory shall perform testing to the following standards:
 - 4.3.3.1 Certified to an IP rating equivalent or better than that of the existing AFC 1.0 Gate, per IEC 60529 Ed2.2; and
 - 4.3.3.2 Certified to pass the spray test in UL325.
- 4.4 Design Review
 - 4.4.1 Customer-Facing Devices, including Gate Options shall be subject to Design Review as described in Appendix 7.
 - 4.4.2 The Design Review of all elements of the User Interface involved in accepting a Tap shall take place simultaneously to ensure consistency across the Devices. All Variants of each Device Type, inclusive of their hardware and User Interfaces shall undergo Design Review together, except that:
 - 4.4.2.1 Design Review for Gate Option 4 may take place earlier than the Design Review for all other Customer-Facing Devices if the SI proposes early installation of System Elements pursuant to Gate Option 4 as described in Appendix 5.2.
 - 4.4.3 The Conceptual Design Review for Customer-Facing Devices shall be based on the Proposal Submittals described in Section 2.2.1.1 of this Appendix 2.3.
 - 4.4.4 The Preliminary Design Review shall include:
 - 4.4.4.1 Updates to the proposed Gate, Fare Vending Machine and Validator specifications described in Section 2.2.1.1 of this Appendix 2.3 based on feedback from the Conceptual Design Review; [CDRL: Gate preliminary design] [CDRL: Fare Vending Machine preliminary design] [CDRL: Validator preliminary design]
 - 4.4.4.2 A style guide for Customer-Facing Devices. The style guide shall reflect the style requirements in Section 3.11 of this Appendix 2.3 and shall include descriptions of the styles proposed for use in the System, including fonts, logo, colors, sample language and iconography. It shall also include an explanation of how the styles align with the MBTA Branding Guidelines, the MBTA Tech Style Guide, and the AFC 2.0 Brand Style & Use Guide and examples of the styles shown on Devices

through screenshots and mockups. [CDRL: Customer-Facing Devices style guide preliminary design]

- 4.4.4.3 Screen mockups. The SI shall provide mockups of all screens and messages to be used on Customer-Facing Devices. This shall include screenshots of each screen layout arranged as a logical flow chart and shall reflect the usability requirements in Section 3.12 of this Appendix 2.3; and [CDRL: Customer-Facing Device screens preliminary design]
- 4.4.4.4 Labels. The SI shall submit Documentation describing all labels designed for use on Customer-Facing Devices, including text, Braille text and indicative placement on Devices. The SI shall also provide sample labels for all label types proposed for use. The labels shall reflect the labels requirements in Section 3.13 of this Appendix 2.3. [CDRL: Customer-Facing Device labels preliminary design]
- 4.4.4.5 Text and audio translations. The SI shall submit translated text and audio as described in Appendix 2.9.
- 4.4.4.6 The SI shall identify accepted formats for audio files (as described in Section 3.10 of this Appendix 2.3) and suitable materials and adhesives for FVM signage (as described in Section 6.1 of this Appendix 2.3).
- 4.4.5 For Final Design Review, the SI shall provide:
 - 4.4.5.1 Revisions of Submittals required in Preliminary Design Review as described in Section 4.4.4 of this Appendix 2.3. [CDRL: Gate final design] [CDRL: Fare Vending Machine final design] [CDRL: Validator final design] [CDRL: Customer-Facing Devices style guide final design] [CDRL: Customer-Facing Device screens final design] [CDRL: Customer-Facing Device labels final design]
 - 4.4.5.2 Prototype of each Customer-Facing Device, including all Variants and all stages of all proposed Gate Option(s).

5. Gate-Specific Requirements

5.1 General Requirements

5.1.1 Input Power

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|---|
| 5.1.1-1 | The Gates shall be built to function with an input voltage between 90 and 134V VAC. | 110V system | |
| 5.1.1-1.1 | The essential performance for the Gates during EMC testing shall be that the Gates meet all of the operational requirements in this document. | Gates need to avoid interruption of service. | Test Software can be used to validate that the System continues to operate. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|---|
| 5.1.1-2 | <p>Upon the loss of their primary power source, the Gates shall be able to use a backup power source to:</p> <ul style="list-style-type: none"> ▪ detect the loss of the primary power source, ▪ report this to the Automated Monitoring Subsystem, ▪ execute an orderly shut down, and ▪ meet the safety requirements in Section 5.7 of this Appendix 2.3, <p>without any data corruption or damage to the Gate and in a manner that will not require any technician or other intervention upon a return to power and full operation.</p> | To prevent unexpected shut downs. | <p>Refers to individual Gates.</p> <p>The gate is not expected to remain in full operation during this period, it only needs to perform the functions listed in the requirement.</p> |
| 5.1.1-3 | The portion of the Communications Network used to connect the Gates in a Location shall be protected by battery backup able to remain powered on for at least one (1) hour after a power loss. | The Gates in a Station need to remain connected through a network in the event of an external network outage so the System can account for the status of all the Gates. | Refers to the local network hub that the Gates connect to. |
| 5.1.1-4 | The Gates shall contain an internal backup power source. | To protect against primary power supply outages. | |
| 5.1.1-5 | The Gates shall include at least (1) duplex AC ground fault circuit interrupter (GFCI) outlet capable of providing 15A. | Provide outlets to allow maintenance personnel easy access to a power source while maintaining the Gates. | |
| 5.1.1-6 | Each Gate shall contain an internal, two-position power switch. | To power up/power down each individual Gate. | |
| 5.1.1-7 | All Gates shall return to their normal operating state within 2 minutes of restoration of power. | Minimize impact to egress when power restored. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 5.1.1-8 | Each Gate shall be able to detect the interruption or loss of power from its primary power source. | In case the Gate needs to utilize a backup power source. Also to report the interruption or loss of power to the Automated Monitoring Subsystem as described in Section 5.1.1-2. | |
| 5.1.1-9 | The Gates shall have the capacity to withstand connection to a circuit providing up to 30A. | The existing capacity of Gates at most Locations is a 30A circuit. | |

5.1.2 Gate Electronics

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 5.1.2-1 | All Gates shall have an internal non-volatile memory. | To store parameters and other information. | |
| 5.1.2-2 | All Gates shall include either a removable solid-state memory module or on-board flash memory. | | |

5.1.3 Sensors/Actuators

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 5.1.3-1 | The SI shall have a method of detecting problems with individual sensors before they result in a failure to meet any of the requirements of Gates as described in this Appendix 2.3. | To limit and expedite service calls when sensors are blocked by environmental conditions, such as dust or grime, or when sensors are out of alignment. | |
| 5.1.3-2 | The data referenced in requirement 5.1.3-1 shall be collected and Configured in the Automated Monitoring Subsystem in a manner that allows the MBTA to query the Automated Monitoring Subsystem. | To help with scheduling maintenance. | |
| 5.1.3-3 | All sensors used in a Gate shall function with a solar radiation exposure of at least 275 BTU/hr/ft ² . | Some Gates will be in direct sunlight. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|---|
| 5.1.3-4 | The optical sensors in the Gates shall be physically adjustable, for example to allow for the aiming of the sensor elements to match up with the console across the Gate opening. The adjustment shall be performed, monitored, and maintained by the SI. | All Gates in a row must be aligned, and the tolerances in the System must be accounted for to achieve this. | |
| 5.1.3-5 | The optical sensors in the Gates shall have a means of sensitivity calibration, for example to allow for the sensitivity of the sensors to be adjusted so that the Gate components know exactly how much signal should be received so that dust buildup and other issues can be detected. The calibration shall be performed, monitored, and maintained by the SI. | To ensure proper installation. | Could be done with an integral laser pointer that could be turned off during normal operation. |
| 5.1.3-6 | All Gate enclosure doors shall include a sensor that detects whether one or more access panels are locked. Alternatively, the SI may propose to manually monitor Gate enclosure doors and provide reports in accordance with the Monitoring Plan. If the SI proposes to manually monitor Gate enclosure doors, the Proposal shall describe its approach to manual monitoring, including an inspection schedule, sampling rates and proposed reporting format. [PSR: Device maintenance] | Safety and security. To detect attempts to get into the Gate interior. | |
| 5.1.3-7 | All sensors referenced in requirement 5.1.3-6 shall report to the Automated Monitoring Subsystem when an enclosure door is unlocked. | The switch may report the door is open sooner. | |
| 5.1.3-8 | All Gates shall include sensors to detect the presence of Users, objects and animals close enough to the Gate doors to be impacted by the closing of the Gate doors and to comply with the safety requirements set forth in Section 5.7 of this Appendix 2.3. An object may include items that commonly accompany transit riders, which may lead ahead of, trail behind or be carried by the User. For example, a baby stroller, shopping trolley, suitcase, handbag, briefcase, etc. | User safety | This indicates the area of proximity detection for a Gate with swinging doors would be appreciably larger than the same area for a Gate with sliding doors. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 5.1.3-9 | The Gate sensors shall be able to detect Users, objects and animals in keeping with reference 1.2.4, subsection 8.1. Sensors shall be able to detect objects and animals when leading or trailing behind the User so that they don't get hit by the Gate. The sensors must detect these entities across the entire width of the Gate aisle with no blind spots. | User safety for small children and adults using mobility devices, as well as service animals and pets. | |
| 5.1.3-10 | The Gate motor control and drive system shall measure its current profile, regularly compare it against its specified profile to detect wear and impediments, and report this information to the Automated Monitoring Subsystem. | Reduce maintenance costs, reduce downtime for Gates by monitoring changes in the amount of current necessary to drive the motor over time. | |
| 5.1.3-11 | The Gate sensors on the exit side of a Gate shall be Configurable: <ul style="list-style-type: none"> ▪ to allow Users to exit upon presenting Media linked to an Account with a zero, negative or specified balance, or ▪ not to require presentation of Media to actuate the Gate, and for the Gate to be able to detect (and effect the opening of the Gate doors) in the presence of a User, or an animal or object taller than eight (8) inches above the finished floor approaching the exit side of the Gate. | Service animals and pets. | |
| 5.1.3-12 | All Gate sensors shall trigger an alarm if blocked for a Configurable length of time. | To discourage loitering in front of Gates. | |

5.1.4 Displays

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 5.1.4-1 | All Gates shall have a graphical display on both the entry and exit sides of the Gate. | To display messages to Users entering and exiting. | |
| 5.1.4-2 | Gate displays shall be located and positioned for visibility: <ul style="list-style-type: none"> ▪ on User approach paths to the Gate, ▪ in the User's line of sight when the User Taps Media at the Reader, and ▪ from a distance of six (6) feet. | Best User visibility | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|------------|---|--|--------------|
| 5.1.4-3 | Gate displays shall provide information about Gate readiness, transaction success or failure and Media status. | To tell the User whether and when entrance is permitted or prohibited. | |
| 5.1.4.-3.1 | Gate displays may provide additional details about the Tap, including the reason for authorization denials, in accordance with Good Industry Practice, Payment Industry Standards and Appendix 3.6. | | |
| 5.1.4-4 | Information on Gate displays shall be easy to understand and shall utilize a combination of lights, color, symbols and text. | | |
| 5.1.4-5 | Any text or symbol displayed shall have character proportions and heights in compliance with the standard in reference 1.1.1. | | |
| 5.1.4-6 | Gate displays shall be capable of displaying all standard ASCII characters and other graphical indications described in Appendix 2.9. | Display must be capable of displaying Configurable graphical indications of both normal operation and out of service statuses. | |

5.1.4.1 Accessible Gate Specific Display Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--|
| 5.1.4.1-1 | Each Accessible Gate shall have a graphical display on both the entrance and exit sides of the Gate (meeting the same requirements of the graphical displays described in Section 5.1.4). | The display must be mounted on the front of the entrance and exit sides of Gate, and be visible to users in wheelchairs. | These requirements are in addition to (not an exception to) the requirements in 5.1.4. |
| 5.1.4.1-2 | The display on Accessible Gates shall be readable from a seated eye height of forty (40) inches above finished floor. | So that it can be viewed from a wheelchair. | |

5.1.4.2 Display Requirements Specific to the Transition Period

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|---|
| 5.1.4.2-1 | If accepting AFC 1.0 Media using AFC 1.0 Equipment during the Pilots and Transition Period, the SI must ensure that the Existing System display remains installed, visible to Users, and not downgraded or altered throughout the Installation, Pilots and Transition Period. | | Gate Options are described in Section 8 of this Appendix 2.3. |
| 5.1.4.2-2 | If accepting AFC 1.0 Media using AFC 1.0 Equipment during the Pilots and Transition Period, the Gate shall interface with the displays of AFC 1.0 Equipment, including illuminated indicator/pictogram displays but must do so through the ICB as set forth in Section 8 of this Appendix 2.3. | Some Gate upgrade options include using Existing System peripherals if the Gate is handling AFC 1.0 Media. | The 1.0 graphical display is a ¼-VGA display. |

5.1.5 Reader Placement Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|---|
| 5.1.5-1 | The Gate shall include at least 2 Readers, one on the entrance side and one on the exit side (as described in Appendix 2.10). Readers shall be placed for easy access by Users approaching each side of the Gate. | To cover entry and exit sides of Gate. | |
| 5.1.5.1-1 | Each Accessible Gate shall include at least four (4) points of presentment, two (2) on the entrance side and two (2) on the exit side (as described in Appendix 2.10). | Covers entry and exit of the Fare Gate. Two of the points of presentment (1 entry, 1 exit) must be mounted as described in requirement 5.1.5.1-2. | This requirement may be met through the use of 4 Readers or 4 antenna fields. |
| 5.1.5.1-2 | One point of presentment on the Accessible Gate shall be mounted on the inside panel of the Gate, so that it is located within the path the User will take to go through the Gate doors, on both the entrance and exit sides of the Gate. | The location of the 2 nd Reader on the AFC 1.0 Gates has been praised by Users using accessibility devices. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|--|
| 5.1.5.1-3 | The points of presentment described in Section 5.1.5.1-2 should be mounted at a height similar to the one on the AFC 1.0 Gates and must be between fifteen (15) and forty-eight (48) inches above the ground. | So that they can be reached by a User in a wheelchair and with. | Currently, the point of presentment on AFC 1.0 accessible gates is 36.5 inches from the floor to the bottom of the reader. |
| 5.1.5.1-4 | The points of presentment described in Section 5.1.5.1-2 shall support Taps in as large of an area as possible. The Proposal shall describe the placement and Tap area for the points of presentment on Accessible Gates. [PSR: Proposed Gates] | So that they can be reached with less accuracy. | The MBTA wishes to support Users in wheelchairs who will mount their Fare Card to their wheelchair. In order to accommodate wheelchairs of different heights and styles, Taps a few inches within the point of presentment should be recognized by the Reader. |
| 5.1.5.1-5 | All Readers shall be mounted in a way they are not flush to the Gate. | So that visually impaired users can perceive its location by touch. | For example, it may be raised or have a border. |

5.2 Physical Requirements

5.2.1 Enclosure Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|---|
| 5.2.1-1 | <p>The clearance width between Gate consoles on any Gate that re-uses AFC 1.0 Gate enclosures shall be at least twenty-three (23) inches. In no event may the SI reduce the clearance of an existing enclosure.</p> <p>Clearance width shall measure the narrowest point between any part of the Gate console or doors when the doors are open and shall not be reduced by the Gate doors.</p> <p>The Proposal shall include the clearance width for any Gate that re-uses AFC 1.0 Gate enclosures. [PSR: Proposed Gates]</p> | Reused Gates are subject to existing clearance, cannot shorten this clearance. | |
| 5.2.1-2 | <p>The clearance width between Gate Consoles installed that do not re-use AFC 1.0 Gate enclosures shall be at least twenty-six (26) inches.</p> <p>The MBTA would prefer for the clearance width on all Gates to be at least twenty-eight (28) inches.</p> <p>The Proposal shall include the clearance width for any Gate that does not re-use AFC 1.0 Gate enclosures. [PSR: Proposed Gates]</p> | Newly installed Gates are subject to new clearance guidelines. | Clearance width measured as described in Section 5.2.1-1. |
| 5.2.1-3 | <p>The clearance width between Gate Consoles in Accessible Gates and AFC 1.0 Gates re-used to meet Accessible Gate requirements shall be at least thirty-six (36) inches.</p> <p>The Proposal shall include the clearance width for Accessible Gates for any Gates the SI will deploy using Gate Option 1, Gate Option 2, and Gate Option 3, and for the Second Stage Work associated with Gate Option 4. [PSR: Proposed Gates]</p> | | See also Appendices 2.9 and 2.10. Clearance width measured as described in Section 5.2.1-1. |
| 5.2.1-4 | Each Gate Console interior shall be accessible for maintenance purposes without the need to take any other Gate out of service. | To minimize impact to Users, Station throughput when maintaining/troubleshooting a particular Gate. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--|
| 5.2.1-5 | The sensors within the Gate Console interior shall be protected by an enclosure that has an IP rating of at least IP55, as per reference 1.1.7. | Rail dust gets into the current System and interferes with operation of the sensors. | AFC 1.0 Equipment does not operate to this standard to MBTA's understanding. |
| 5.2.1-6 | All lenses for the optical sensors shall be comprised of anti-static material. | To avoid buildup of rail dust. | Examples include: Cyastat SN50 (American Cyanamid CO.) No. 03643 (AKZO Chemicals) S154 (Morton) |

5.2.2 Surrounding Area Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--------------|
| 5.2.2-1 | All Gates shall be mounted level to each other whether or not the ground in that area is level. If reusing AFC 1.0 Gates and any issue with level is discovered, the SI shall resolve in accordance with the requirement set forth in Appendix 2.9. | In order to align the sensors, all Gates in a row must be level with each other. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|---|
| 5.2.2-2 | <p>If a floor covering is used for Gate installation, it shall:</p> <ul style="list-style-type: none"> ▪ Either (a) not extend beyond the Gate aisle, or (b) be continuous along the entire Gate Array and include a slope at all approaches (including front and side) for any part of the floor covering that does extend beyond the aisle. ▪ Be made of a material which is slip-resistant when wet and non-conductive. ▪ Have the least possible slope on all approaches and not include any slope greater than 1:50 unless preexisting. ▪ Have a beveled edge on all approaches. ▪ Not rise more than 2cm. ▪ Have a continuous common surface, which is stable and firm. ▪ Not be interrupted by steps or changes in level greater than 6mm. ▪ Have a level landing on each side with a safe distance between any slope and hazards such as stairs or tracks. ▪ Be capable of supporting the weight limit of 100 PSI with a 3X safety factor and no deflection. <p>If a floor covering is proposed for use, the Proposal shall include a description of the proposed floor covering, including an explanation of how the proposed floor covering does not create a tripping hazard or hinder Accessibility access, schematic diagrams (specifying measurements of the floor covering, measurements of the floor covering relative to the Gate aisle, rise and run) a description of the surface material, details about weight limits, and identification of stations where floor covering would not be appropriate.</p> <p>[PSR: Proposed Gates]</p> | <p>To ensure that the floor covering is not an obstacle for people, objects (including power wheelchairs) and animals in transit. The floor covering must not introduce a tripping hazard or additional Accessibility challenge.</p> | <p>Requirement for safe level landing on each side may prevent the use of floor coverings in some stations.</p> |

5.2.3 Gate Doors

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--|
| 5.2.3-1 | <p>Gate doors shall be able to withstand as close as possible to the following:</p> <ul style="list-style-type: none"> ▪ a horizontal impact equivalent to a 136 kg (300 lb) person moving at 4.83 kph (3 mph) ▪ a downward impact equivalent to 1336 Newtons (300 lbf) <p>The SI shall demonstrate the quantified resistance of Gate doors as described in requirement 4.2-10.</p> | | |
| 5.2.3-2 | All Gate doors shall meet the relevant closing force and closing energy requirements, based on door type, in reference 1.2.5 subsection 29.4. | To prevent the doors from closing on and injuring a User. | Accessibility guidelines |
| 5.2.3-3 | Gate doors shall not be fully transparent. | For accessibility, the barrier must be obvious to Users. | For example, Gate doors should be made from a material that is not transparent, use tinted glass and/or have a high visibility border. |
| 5.2.3-4 | The lower edge of the Gate door shall be lower than 4” or higher than 12” above the finish floor. | To prevent Users in wheelchairs from getting their feet caught on the bottom of the door. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--------------|
| 5.2.3-5 | <p>The shape of the Gate doors and any gaps between the doors when they are closed or at the point specified in requirement 5.6-3.1 shall prevent Fare evasion through a design which limits the User's ability to jump over, crawl under or squeeze through the doors.</p> <p>The Proposal shall include:</p> <ul style="list-style-type: none"> ▪ Detailed measurements of the doors and any gaps between the doors when they are closing or closed; ▪ An explanation of how the design of the Gate doors helps prevent Fare evasion; and ▪ If applicable, examples of other transit systems where the proposed Gate doors are in use. <p>[PSR: Proposed Gates]</p> | | |

5.3 Interface Requirements

5.3.1 Usability Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--------------|
| 5.3.1-1 | All Gates shall indicate which side of the Console the user should pass through after Tap and upon entering the Gate (e.g. right versus left). | To aid User throughput | |
| 5.3.1-2 | <p>The Gate System shall be able to process users at a rate of at least 40 per minute. The implementation and test plans must address this requirement and testing must demonstrate compliance.</p> <p>The Proposal shall identify the throughput for each Variant of Gate and type of Media proposed for use as part of the System, and an explanation of how that throughput was tested or validated. [PSR: Proposed Gates]</p> <p>Tests shall attempt to simulate real world conditions, for example, Users simultaneously entering and exiting and Mobile Fare Card Users with cracked or dimmed screens.</p> | Station design, Egress Standards, Transportation Network efficiency | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--|
| 5.3.1-3 | The Gates shall have the ability to open/close the Gate doors based on an internal operator interface using an SI-provided tool reasonably acceptable to the MBTA. | To allow manual operation of Gate for maintenance or when the CN is not accessible. | |
| 5.3.1-4 | <p>The Proposal shall include a concept white paper for varying Gate parameters based on User attributes. The white paper shall explain the challenges of accommodating different types of Users, explore limitations of currently available technical solutions and suggest approaches that could be explored in the future.</p> <ul style="list-style-type: none"> ▪ Gate parameters could include: speed of doors closing, length of time doors remain open, number of Users allowed to pass through, messages displayed to the User. ▪ User attributes could include: distinguishing between an adult and a child, and a wheelchair, a baby stroller and a shopping trolley. ▪ Approaches could include: the use of Gate sensors to determine the User's height, gait, etc., the use of User-Established Customizations, or changes in agency policies and practices. <p>[PSR: Gate variation based on User attributes concept white paper]</p> | The intent of this requirement is to accommodate different types of Users, not for Fare evasion control. | The MBTA appreciates creative responses which draw on Proposers' experience in the transit sector. |

5.3.2 Gate Interface to Other System Elements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|---|
| 5.3.2-1 | <p>All Customer-Facing Devices shall include in status reports to the Automated Monitoring Subsystem of the following date and time-stamped metrics:</p> <ul style="list-style-type: none"> ▪ System status ▪ Error conditions (with relevant error codes) ▪ Power loss ▪ Power restoration ▪ Network connectivity loss ▪ Network connectivity restoration ▪ Gates encountering an obstacle during closing ▪ Suspected fare evasion behavior (any irregular entry such as interference of operation with Gate doors or where it appears more than one User has passed through without additional Reader accepted Tap) | | Suspected fare evasion behavior shall include attempts to force Gates open, suspected piggy-backing, two Users passing through Gates at the same time in opposite directions, a User standing in Gate aisle for long enough to trigger the Gate doors to open and Gate doors remaining open for longer than normal. |
| 5.3.2-2 | <p>The SI shall implement a method by which the MBTA can remotely request and achieve immediate opening of individual and multiple Gates.</p> <p>The Proposal shall include a description of the method for remote Gate opening. [PSR: Proposed Gates]</p> | For egress. | |
| 5.3.2-3 | The System shall be aware of the status of each Gate in the Gate Array, and must be Configurable in order to use that information in implementation of other requirements. | To allow for more complex algorithms than simply opening the Gate during a perceived malfunction. | For example, the status of Gates shall be able to change based on the status of other Gates in their Gate Array. To be implemented via potential future rules engine as an MBTA Change. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|---|
| 5.3.2-4 | Any Gates (and AFC 1.0 Gates with System Elements installed) using AFC 1.0 Equipment to read AFC 1.0 Media shall maintain a working connection to the Existing System communications network and comply with requirement 4.1-7. | Any AFC 1.0 Equipment processing AFC 1.0 Media must retain a connection to the Existing System. | The SI may not do anything to interfere with such System and will be responsible for any such interference. |

5.3.3 Other Gate Interfaces

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|---|
| 5.3.3-1 | All Gates shall, through a digital electronics input/output (I/O) signal provided by the SI, be able to accept from an undefined future MBTA System a signal capable of triggering the opening of each Gate, individually, in the case of an emergency. The SI shall propose the technical specifications for this interface signal. [PSR: Proposed Gates] | For potential upgrade to the fire alarm emergency system. Actual software development to connect this system would be an MBTA Change. | The MBTA intends to have a hard wired, not a central office based solution. |

5.3.4 Station Interfaces

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|----------------------------------|--------------|
| 5.3.4-1 | The System shall be able to open all Gates in an Array or Station when a fire alarm or other emergency alarm is active. | Compliance with Egress Standards | |

5.4 Data Definition and Transmission Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--------------|
| 5.4-1 | All Gates shall keep count of User passage even when passages are not authorized by a Reader signal or when the Gate doors are inoperative, including when Gate doors are Configured to be open, except in the event of power loss longer than specified in Section 5-1.1-2. | To keep a more accurate count, even when Gate doors are not cycling open and closed. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--------------|
| 5.4-2 | <p>All Gates shall track at least the following:</p> <ul style="list-style-type: none"> ▪ the time elapsed between the Reader sending a message to the Gate to open the Gate doors and the Gate doors opening, ▪ the time between the Gate detecting customer has cleared the Gate and commences closing the doors closing, and ▪ the total time between the Reader sending a message to the Gate to open the Gate doors and the Gate doors closing. <p>The tracked information shall be made available in the Automated Monitoring Subsystem.</p> | To help with scheduling maintenance and to identify ingress/egress trends that could be helpful to the MBTA. | |
| 5.4-3 | Any Data exchanged between the Gates and the Automated Monitoring Subsystem and all other reports shall include information that identifies the Gate Array and each relevant Device. | All Devices must ID Location and Device, this is an extra level of ID necessary for the Gates. | |

5.5 Installation and Acceptance Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 5.5-1 | All Gates shall be designed and manufactured for compliance with reference 1.2.2 and the Egress Standards, as related to means of egress and Accessibility, as well as Appendix 2.9, and the SI must check for and confirm actual compliance in the SI's inspection and acceptance of the DB Installation Work. | | |

5.6 Operation and Maintenance Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--------------|
| 5.6-1 | Each Gate Console shall include a function to allow a technician to operate, maintain and test the Gate and Reader. Transactions during maintenance and testing shall be reported to the Automated Monitoring Subsystem as maintenance and testing activities and not in Revenue Service. | To enable service personnel to maintain/troubleshoot machine in the field. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|---------------|
| 5.6-2 | Each Gate shall commence opening the Gate doors within 0.05 seconds after: a) receiving a message or signal from the Reader to open the Gate doors or, b) confirming presence of a User, object, or animal approaching the Gate doors from a side of the Gate which is configured not to control passage by way of Reader interaction. | User flow rate, ease of egress. | |
| 5.6-2.1 | Each Gate shall completely open the Gate doors within 1.0 seconds after a triggering event described in requirement 5.6-2. | User throughput, ease of egress | |
| 5.6-3 | Each Gate shall commence closing the Gate doors within 0.05 seconds after determining a User has passed through the Gate doors. | To combat Fare evasion. | |
| 5.6-3.1 | Each Gate shall close the Gate doors to within six (6) inches of completely closed within 0.8 seconds of making the determination described in requirement 5.6-3. If the doors move when pushed against using a force less than that specified in requirement 5.2.3-1, any capacity to open shall be included in this limit. | To help combat known Fare evasion methods | |
| 5.6-4 | The time in requirement 5.6-3.1 shall be Configurable, with the slowest available rate of Gate door closure being no faster than the speed necessary for the outer edge of the door to move horizontally towards its closed position at 0.305 meters/second. | To allow Users requiring more time to pass through Gates (for example, not fully abled Users or Users with young children) per reference 1.2.4, but still combat Fare evasion methods. | 1 foot/second |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--------------|
| 5.6-5 | <p>Each Gate shall be able to queue multiple successful Validation Taps to allow multiple Users to pass through in sequence from a particular direction. The degree to which such queuing of Taps is allowed shall be Configurable. The Gate shall continue to track and implement this queuing of Taps for entry even if a User passes through the gate in the opposing direction. Queued entry Taps shall not prevent a User from being able to exit.</p> <p>The Proposal shall include a description of its approach for queuing taps, and explain how queued entry Taps affect a User attempting to exit. [PSR: Proposed Gates]</p> | To manage throughput in both directions. | |
| 5.6-6 | The System shall Configurably support the opening of all Gate doors in all Locations in the event that Fare Policy or a discount or promotion (as described in Appendix 3.7) results in free travel for all Users. | | |

5.7 Safety Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|--------------|
| 5.7-1 | <p>During a loss of the Gate power source, the Gate doors shall open and remain open.</p> <p>The Proposal shall describe the approach to ensuring compliance with the Egress Standards during power failure. [PSR: Proposed Gates]</p> | In the event of a failure, people need to be able to get out of the station. | |
| 5.7-2 | All Gate motor controllers shall be able to detect if a User, animal or object impedes the closing of the doors, irrespective of whether the object is detected by the Gate sensors, and the Gate doors shall retract until sensors are triggered to indicate the object has passed through the Gate area. | To prevent snags of baggage, and to prevent injury to persons, service animals or pets caught in the doors. | |
| 5.7-3 | Upon detection that Gate doors are obstructed while closing, the doors shall re-open within 0.5 seconds. | User safety | |

5.8 Audio Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--------------|
| 5.8-1 | Each Gate shall emit a Configurable audible tone when the Gate doors transition from closed to open upon acceptance of a Tap. | Ease of User egress – helpful for visually impaired Users | |
| 5.8-2 | Each Gate shall emit a Configurable audible tone when a User attempts to use a Gate already in use by another User. | | |

6. Fare Vending Machine Requirements

6.1 General FVM Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|---|
| 6.1-1 | The System may include multiple Fare Vending Machine Variants, including a Full-Functionality FVM and a Limited-Functionality FVM. Full-Functionality and Limited-Functionality FVMs must meet all of the requirements for FVMs specified in this Appendix 2.3, unless otherwise specified. Location requirements for each Variant are described in Appendix 2.10. The Proposal shall include a description of the Variants and justification for the approach. [PSR: Proposed Fare Vending Machines] | | |
| 6.1-2 | If the proposed Fare Vending Machine requires an external power supply, it shall work with an input voltage between 90 and 134V VAC. | 110V system | FVMs which do not require an external power supply will also be acceptable. |
| 6.1-3 | Fare Vending Machines shall facilitate the display by the MBTA of stickers or placards identifying widely-sold Products and, in particular, Stored Value Product amounts for the most common Trips from the Location on the Fare Vending Machine. The SI shall identify suitable materials and adhesives for such signage in the Fare Vending Machine preliminary design. [CDRL: Description of suitable materials and adhesives for FVM signage] | | |

6.2 FVM Functional Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--|
| 6.2-1 | Fare Vending Machines shall issue new Fare Cards with both Pass Products and Stored Value Products. Full-Functionality FVMs shall issue only Standard Fare Cards. Limited-Functionality FVMs may issue Temporary Fare Cards if they are not capable of issuing Standard Fare Cards. | | If all Variants of the Limited-Functionality FVM are capable of issuing Standard Fare Cards, there is no requirement for Temporary Fare Cards. |
| 6.2-2 | Full-Functionality Fare Vending Machines shall be capable of providing a User with multiple Fare Cards with identical Product or Value selection in a single User Session. If possible, Limited-Functionality FVMs should also meet this requirement. | | |
| 6.2-3 | Fare Vending Machines shall Activate and Enable Fare Cards upon payment for a Product and payment of the applicable Enablement Fee. Fare Cards stored in the Fare Vending Machines must not be Active nor Enabled. | | |
| 6.2-3.1 | Fare Vending Machines shall support the payment of an Enablement Fee and purchase of a Product in a single User Session. | | |
| 6.2-4 | Fare Vending Machines shall allow Users to reload Value on any valid Account using the primary Credential for that Account, for all Fare Media accepted by the System. | | |
| 6.2-5 | Fare Vending Machines shall support the following Account inquiry features: <ul style="list-style-type: none"> ▪ Account Balance check ▪ Pass type check ▪ Full-Functionality FVMs shall support Account management features, including: <ul style="list-style-type: none"> ▪ View recent travel history ▪ View recent transaction history | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--|
| 6.2-6 | Fare Vending Machines shall indicate to Users when any functions are not available. | | Examples include: bills not accepted, no credit cards and/or debit cards accepted. |
| 6.2-7 | Fare Vending Machines shall have Configurable capability to display Product pricing information, and must display pricing information for User confirmation prior to completing a sale transaction. | | |
| 6.2-8 | Full-Functionality Fare Vending Machines shall have a Configurable screen saver capable of supporting: <ul style="list-style-type: none"> ▪ a single static image in any common graphics format, including .JPG, ▪ .TIFF, .BMP, ▪ a repeating “slide show” of static images in common graphics format, ▪ a pre-recorded video in any common format, including .MPEG, .WMV, ▪ .MOV, .AVI, and ▪ any combination of the above. | | |
| 6.2-8.1 | The screen saver will automatically terminate as soon as any FVM control is activated. | | |
| 6.2-8.2 | The screen saver time-out will be Configurable. | | |
| 6.2-9 | The Full-Functionality Fare Vending Machine shall support Users in transferring an Account Balance from a Temporary Fare Card as set forth in Appendix 2.6. If the Limited-Functionality Fare Vending Machine dispenses Standard Fare Cards, it should also meet this requirement. | | |
| 6.2-10 | The SI shall ensure that all FVMs are stocked with and able to dispense Fare Cards. Any FVM which is not able to dispense Fare Cards shall be considered not to be operating in accordance with the Technical Requirements. | | |

6.3 FVM Usability Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|---|
| 6.3-1 | Fare Vending Machines shall be designed in a way that supports the User in completing the transaction as quickly as possible. | | |
| 6.3-1.1 | Fare Vending Machines provide clear steps for Users to initiate/complete transactions, make selections, and insert payment. | So that Users know where to start, what to do next and where to collect the Fare Card when they are done. | |
| 6.3-1.2 | Fare Vending Machines shall provide access to frequent transactions from the first User Interaction with the Device. Frequent transactions shall be Configurable by the MBTA and based on the User's purchase history, most popular FVM transactions or most popular transactions for a specific Location. | | For example, purchase a 1 way trip, round trip, add \$10. |
| 6.3-1.3 | Fare Vending Machine content shall be concise and intuitive enough so as to never (or rarely) require the user to read long blocks of text. | So that Users are not standing at machines for a long time reading. | |
| 6.3-2 | Fare Vending Machines shall support users interacting with them with one hand. They must not require a user to simultaneously perform two different actions. | To enable use by Users with limited dexterity or those who are carrying items. | For example, FVMs must not include a covering that requires the user to lift with one hand/finger while inserting or retrieving from the FVM with the other hand/finger or require the User to press a button to request more time while simultaneously reinserting a Payment Card. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--|
| 6.3-3 | The FVM shall support use by Users with limited use of their hands by not requiring tight grasping, a strong grip, pinching, grabbing a small surface area, or pushing/pulling with smoothness, consistent speed or strength. | | Of particular importance when inserting and removing Payment Cards. Recommendation for Payment Cards to protrude at least 2cm from the surrounding slot. |
| 6.3-4 | FVM input and output areas shall be positioned in a way that does not require Users to reorient themselves during operation and must meet standards for height and reach described in Appendix 2.9. | | For example, speaker volume and positioning must make it possible for the User to hear the audio while using keypad and inserting payment and keypad should not be recessed in a way that requires wheelchair Users to lean. |
| 6.3-5 | All FVM interaction areas shall be viewable and discernable under all light conditions found in the Location where the Device is placed. | Some will be in Stations with poor lighting, others could be in direct sunlight. | |
| 6.3-5.1 | If the design of the FVM or its placement in the installation Location casts a shadow on the keypad or card slot, these areas shall be illuminated. | To make it easier for Users to see. | |
| 6.3-6 | FVM controls shall be adequately sized and sufficiently spaced to support operation by Users with limited dexterity. | To account for lack of motor control, shaking hands, etc. | The user should be able to operate any control without accidentally operating any other control. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|---|
| 6.3-7 | If present, a privacy hood on the keypad shall not block a User with limited manual dexterity from inputting using the keypad. | To accommodate Users using two hands to make selections on the keypad. | |
| 6.3-8 | FVM buttons and keys shall provide tactile and audio feedback. FVM on-screen selections shall provide visual and audio feedback. | To indicate the operation of controls. | |
| 6.3-9 | If a ten number keypad is used on the FVM, it shall use telephone layout and shall have a single raised dot on the 5 key. | To help users orientate their fingers on the keypad by touch. | Other identifiers for the 5 key, including bars on each side, are not acceptable. |
| 6.3-10 | The FVM shall have a User Session time out period to cancel the transaction and return the FVM to the idle state following a Configurable period of inactivity between steps of a transaction and between transactions. The User Session time out shall provide visual and audible warning notifications and an easy way for Users to request more time. | To allow sufficient time for the slowest Users and to reset when a User has walked away without completing a transaction. | |
| 6.3-11 | Where provided, controls, characters and symbols shall contrast visually from background surfaces. | | |
| 6.3-12 | Fare Vending Machines shall support the sale of Zoned or distance-based Stored Value Product amounts and Pass Products without requiring the User to know what Zone he/she is traveling from/to. | | |
| 6.3-12.1 | Where station search is available to a User, the search shall predict the User's entry based on the first few letters entered, be tolerant of misspellings, recognize partial names and return results for alternate names. | | |
| 6.3-13 | Fare Vending Machines shall provide an option for the User to cancel the transaction at any time during the User Session prior to: <ul style="list-style-type: none"> ▪ the insertion and acceptance of any currency, starting with the first bill or coin inserted; or ▪ the presentment of a Payment Card for payment. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--------------|
| 6.3-14 | Upon cancellation of a transaction, the FVM shall a visual and audible notification to the User that the transaction has been cancelled and if applicable, the reason why the transaction was cancelled. | | |

6.4 FVM Payment Requirements

The Proposal shall describe the features and functionality of the proposed Fare Vending Machine(s) that support User-friendly payments. This summary of FVM payments usability considerations shall be based on the requirements of this Section 6.4 and Good Industry Practice. [PSR: Proposed Fare Vending Machines]

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--------------|
| 6.4-1 | Fare Vending Machines shall accept all payment types defined in Appendix 3.6, as well as US currency in accordance with Section 6.4-2. | | |
| 6.4-2 | Fare Vending Machines shall accept the following US currency denominations: <ul style="list-style-type: none"> ▪ \$20 ▪ \$10 ▪ \$5 ▪ \$1 (bills and post-1978 coins) ▪ \$0.25 ▪ \$0.10 ▪ \$0.05 | | |
| 6.4-3 | As cash is inserted, the FVM shall indicate the value remaining to be deposited for the selected transaction. | So that the User knows how much more cash to insert. | |
| 6.4-4 | Fare Vending Machines shall accept 99% of “fit for distribution” bills and coins, as defined by the Federal Reserve’s published fitness guidelines. The Proposal shall include a bank note and coin acceptance plan and a method to demonstrate compliance with this standard. [PSR: Proposed Fare Vending Machines] | | |
| 6.4-5 | Fare Vending Machines shall return US currency (bills and/or coins) of equal value to inserted currency when a transaction is cancelled. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|---|---|
| 6.4-6 | <p>Fare Vending Machines shall provide change to Users.</p> <p>The Proposal may include a cost-saving option for Fare Vending Machines which do not provide change.</p> <ul style="list-style-type: none"> ▪ Details related to the price of such option shall be included in Proposal Form 14 and excluded from the Technical Proposal. [PSR: Form 14] ▪ Details related to the Device functionality and User experience associated with such option shall be included in the Technical Proposal. [PSR: Proposed Fare Vending Machines] ▪ Device functionality associated with such option shall be demonstrated during the device demonstration described in Section 2.2 of this Appendix 2.3. [Technical Proposal Evaluation: Demonstration] | | The proposal to not provide change shall assume that the entire amount of cash inserted by the User be credited to his/her Account. |
| 6.4-7 | <p>Fare Vending Machines shall continue to operate when limited or no change can be given provided that:</p> <ul style="list-style-type: none"> ▪ The FVM shall provide a message to notify the User that limited or no change is available at the start of the User Session and immediately before the User inserts a cash payment; ▪ Both instances of such message shall be visible on the Device and audible through the audio instructions; and ▪ The entire amount of cash inserted by the User shall be credited to his/her Account or returned to the User in accordance with requirement 6.4-5. | | |
| 6.4-8 | <p>If a specific orientation is required by the FVM for cash or Payment Card to be inserted, the FVM shall be labeled with clear examples shown. The label shall include braille and tactile icon and audio shall describe how to hold and insert cash and Payment Cards. Payment Card instructions shall include how long to leave the card inserted and how/when to remove it.</p> | To minimize the need for multiple attempts by user to make payment. | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--------------|
| 6.4-9 | Fare Vending Machines shall be capable of implementing Payment Card address or postal code verification. | | |
| 6.4-10 | Fare Vending Machines shall include automatic prompting for debit card PIN entry. | | |
| 6.4-11 | The design of the slot where the Payment Card is inserted into the FVM shall have a raised edge to help the User locate the slot, guide the User in aligning the card for insertion and prevent the insertion of a misaligned card. If present, a privacy hood on the card slot shall not block the User's access to grab the card for removal. | | |
| 6.4-12 | When a User has inserted a Payment Card into a Fare Vending Machine for payment, the transaction shall not be completed until the User has removed the card from the machine. | To help avoid Users leaving their card in the FVM after making a transaction. | |
| 6.4-13 | Fare Vending Machines shall automatically detect what form of payment the User has inserted. | So that Users will not have to declare whether the transaction will be by cash or card. | |
| 6.4-14 | Fare Vending Machines shall be capable of providing receipts upon User request. | | |

6.5 FVM Security Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 6.5-1 | Fare Vending Machines shall only make sales of Products when the System is able to post the transaction Data to the User's Account in accordance with the requirements set forth in Appendix 3.8 and also, in the case of Payment Card transactions, only make sales following receipt of an approved Authorization response. | | |
| 6.5-2 | Fare Vending Machines shall reject currency that is foreign, copied, or counterfeit. The Proposal shall include a plan for currency rejection. [PSR: Proposed Fare Vending Machines] | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|--|--|
| 6.5-3 | Each Fare Vending Machine shall include a mechanical assault sensor that works during power loss and includes "tamper evidence" mechanisms that clearly show evidence of actual or attempted tampering. | To determine if someone is trying to tamper with the FVM, including when power is unavailable. | |
| 6.5-3.1 | If the mechanical assault sensor detects an intrusion that includes unauthorized attempts at tampering with the data storage module, it shall trigger active/passive tamper mechanisms that completely delete all stored data, bank keys, PII, and other sensitive information as defined by the PCI-SSC. | | The applicability to of relevant PCI-SSC standards to the System shall be determined by the QSA as described in Appendix 3.10. |
| 6.5-4 | The SI shall take steps to prevent Fare Vending Machines from being subject to Payment Card and PIN number skimming attacks using Good Industry Practice for protecting unattended payment terminals, including operational and physical security countermeasures and regular Device inspections. | | |

6.6 FVM Environmental Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--|
| 6.6-1 | The proposed Fare Vending Machine Variants shall operate in multiple environments, including: <ul style="list-style-type: none"> ▪ Rapid Transit Stations ▪ sheltered areas ▪ outdoor and unsheltered areas. | | Outdoor and unsheltered areas include Light Rail surface Stops, Commuter Rail Stations, bus Stops. |
| 6.6-2 | The proposed Fare Vending Machine(s) shall support all environments. If Variants are required to support different environments, these shall be described in the proposed Fare Vending Machines Submittal in the Proposal. [PSR: Proposed Fare Vending Machines] | | |

6.7 FVM Audio Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|------------------|--------------|
| 6.7-1 | Full-Functionality Fare Vending Machines shall have audible voice instructions available at the request of the User and presented through a speaker and headphones. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|---|
| 6.7-2 | Limited-Functionality Fare Vending Machines shall have audible voice instructions available at the request of the User and presented through a headphones. To the extent possible, voice instructions shall also be presented through a speaker. | | Preference is for all FVMs to provide voice instructions via both speaker and headphones. |
| 6.7-3 | Voice instructions shall be activated through the speaker through user interaction with a mechanical button. | | |
| 6.7-4 | When headphones are plugged in to the FVM, voice instructions shall be available without requiring any additional User Interaction to activate audio and the speaker shall be disabled. | User does not need both headphones and speaker. If headphones are inserted, it is the User's intention to use audio. | |
| 6.7-5 | Volume on both the speaker and headphones shall be adjustable by the User. Any adjustment made should last through the entire User Session. | | |
| 6.7-6 | Voice instructions shall be terminated with either the cancellation of the transaction, time out of the User Session as described in requirement 6.3-10 or completion of the transaction. | | |
| 6.7-7 | Voice instructions for any single function shall be automatically interrupted when the User makes a selection. | | |
| 6.7-8 | Voice instructions shall be capable of being repeated. | | |
| 6.7-9 | Voice instructions shall be in the language selected or indicated in the User-Established Customizations. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|---|
| 6.7-10 | <p>The FVM shall convey all necessary messages to aid the visually impaired in completion of a transaction, including:</p> <ul style="list-style-type: none"> ▪ clear cues and instructions about what to do next, ▪ an optional description of the FVM layout and inputs for Users unfamiliar with the Device, ▪ a description of any Device response that would be visible to a sighted User (e.g. the return of an inserted bill), ▪ all instructions visible to a sighted User, and ▪ prioritization of the most important information. | To support audio Users in completing the transaction quickly and successfully. | For example, scrolling text at top of FVM, instruction for how fast card needs to be inserted and removed, where to collect Fare Card, Account Balance. |
| 6.7-11 | <p>The FVM shall support inputs from Users who are using voice instructions, including:</p> <ul style="list-style-type: none"> ▪ When voice instructions are in use, the User shall be able to make all selections using tactile buttons. If this requirement is met through the use of an alternate input area, the primary input area shall also remain available to audio users; ▪ Where the voice instructions require the use of the keypad for inputs, inputs shall be single digit to the extent this is possible; and ▪ Where letters or numbers are used on FVMs to identify selection of menu items, they shall be the same for sighted users and audio assisted users. | To make it easier for visually impaired Users and the people who assist them to use. | |

6.8 FVM Screen Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--|
| 6.8-1 | If the Full-Functionality FVM contains a screen, the screen shall support options for modified display mode(s) with increased contrast and increased text size, which shall be activated and deactivated through a User Interaction with a mechanical button. | For visually impaired users. | This requirement may be met through the use of User-adjustable settings for contrast and text size or through the implementation of an alternate display mode with high contrast and large text. |
| 6.8-1.1 | If the Limited-Functionality FVM contains a screen, it shall either (a) meet requirement 6.8-1 or (b) use high contrast and large text in its default display mode. | | |
| 6.8-2 | If the FVM contains a screen, it shall support the option for the User to enable a privacy display mode. When the privacy display mode is active, other parts of the display screen shall be black, not show any information about User Interactions, and have a message stating "Privacy screen is active" and provide instructions on how to cancel. | For personal security and privacy of Users using audio instructions and in wheelchairs. | |
| 6.8-2.1 | The privacy display mode shall be activated and deactivated through User Interaction with a mechanical button. The option to activate the privacy display mode shall be presented to the User, audibly and visually, immediately upon activating audio instructions via speakers or headphones. The option shall not be available to Users who have not activated audio instructions. If the User does not take action when presented the option for the privacy display mode, the privacy display mode shall not be activated and the User shall be able to continue with the transaction. | | Privacy display mode shall not be automatically activated for audio Users. |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--------------|
| 6.8-3 | If the FVM contains a screen, the screen shall be visible from a point located forty (40) inches above the floor space where the display screen is viewed. | To accommodate Users seated in wheelchairs. | |
| 6.8-4 | On screen characters shall be 3/16 inch high minimum based on the uppercase letter "T". Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background. | | |

7. Validator Requirements

In the event that conflict exists between the requirements set forth below and in Appendix 2.12, Appendix 2.12 shall take precedence in the context of Vehicle installations and equipment.

7.1 General Validator Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--|
| 7.1-1 | Validators shall be placed at MBTA Stations in accordance with the Quantity Standards, including by the SI accounting for all necessary DB Installation Work in the DB Plans and Specifications. | | Quantity Standards are described in Appendix 2.10. |
| 7.1-2 | Validators shall include a graphical display meeting the requirements for graphical displays set forth in Section 3.2.3 of this Appendix 2.3. | | |
| 7.1-3 | Validators shall include discrete LEDs of at least three colors (including at least red and green), capable of being seen by a User from all angles around the Validator. The Validators shall use these LEDs in concert with other indications to communicate Tap results to Users. | | |
| 7.1-4 | Validators shall include at least three (3) ISO7816-compliant SAM slots. | | |
| 7.1-5 | Validators shall be Configurable capable of displaying messages to the User about the status of a Tap, including accepted Tap, processing, rejected Tap, reason for Tap not accepted, and unsuccessful Tap read. | | |

7.2 Station Validator Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|------------------|--------------|
| 7.2-1 | Station Validators shall work with a variety of input voltages and the SI shall adapt the Station Validators for compatibility with the available power facilities at each Location. | | |

7.3 Vehicle Validator Requirements

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|--|--|--|
| 7.3-1 | Vehicle Validators shall NOT interface with existing systems on Vehicles, except as provided in Appendix 2.12 or Appendix 2.5. | | |
| 7.3-3 | The System shall be capable of placing the Vehicle Validators in an operational mode in which the Validator does not accept Media for Validation. | | |
| 7.3-4 | Vehicle Validators shall automatically be turned on and fully functional when the Vehicle engine is on. This requirement shall not require the Vehicle operator to turn Validator power on. | | |
| 7.3-5 | Vehicle Validators shall remain fully operational while the Vehicle engine is off or starting for at least thirty (30) minutes unless the Vehicle has returned to an MBTA garage or carhouse. This requirement shall not require the Vehicle operator to turn Validator power off or on. | For example, to process Taps at bus route layover points where the engine may be shut off. | The SI must account for power stability issues to ensure that Taps made while the engine is starting are received. |
| 7.3-6 | Vehicle Validators may draw from the Vehicle battery for a limited amount of time. Power draw limitations vary by Vehicle model, and the SI must account for these limitations in the design and manufacture of the System Validation Equipment. | | Newer buses have an automatic battery management shut off limit. |
| 7.3-7 | The Vehicle Validators shall comply with the network standards in Appendix 2.5. | | |

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>Notes</i> |
|-----------|---|---|--------------|
| 7.3-8 | <p>The Vehicle Validators shall NOT require the use of an antenna external to the Vehicle.</p> <p>If an antenna or other centralized communication module is proposed for use internal to the Vehicle, the Proposal shall describe the proposed wiring, mounting location and installation method in the Submittals required by Appendix 2.12. The proposed approach shall consider signal quality, thickness and other characteristics of the Vehicle materials, and interference with other on-board devices. The Proposal shall include information to support the proposed approach such as previous experience or existing testing Documentation.</p> | <p>Garages and carhouses where SI Installation Work is to be performed lack sufficient fall protection equipment and space for work on the roof of a Vehicles.</p> <p>On certain Vehicles, significant engineering validation and testing would be required to identify an appropriate mounting location and significant support may be required to modify the Vehicle body.</p> <p>To avoid asbestos which has been disclosed to the SI through the Reference Documents.</p> | |

8. Gate Implementation Options

The SI must: (1) select from the Gate Options described and drawn in Sections 8.2, 8.3, 8.4, and 8.5; (2) identify the selected Gate Option(s) in the Proposal [PSR: Gate Option selection]; and (3) implement the selected Gate Option(s), directly and by reflecting applicable requirements in the DB Plans and Specifications. Section 8.1 constrains the options available for some existing AFC 1.0 Gates. If a combination of Gate Options is selected, the Proposal must explain in detail the option applicable to each Location and which AFC 1.0 Gates will be re-used. If the SI selects any Gate Option other than that described in Section 8.2, the SI must also implement the respective Second Stage Work described and drawn in Sections 8.6 and 8.7.

The Proposal must also include:

- Itemization of what AFC 1.0 Equipment will be re-used, and, for all such equipment, what component or sub-component will be re-used and for what purpose and for what stages of the Gate implementation; [PSR: Gate Option selection]
- Itemization of what AFC 1.0 Equipment will be taken out of Revenue Service, when that will be done in the System transition timeline, and how User impact will be minimized; [PSR: Gate Option selection]

- Itemization of every improvement the SI believes will be required to be made to any re-usable AFC 1.0 Equipment that the SI intends to use, in order to meet the Contract Standards; [PSR: Gate Option selection]
- Applicable requirements in the DB Plans and Specifications to reflect the selected Gate Option(s).

Proposers may propose a combination of the Gate Options identified herein both by Location and temporally. However, no Proposer may:

- Propose any Gate Option other than those set forth in the following provisions;
- Alter any of the identified Gate Options;
- Utilize any of the intellectual property included in the AFC 1.0 Gates in the System other than as expressly permitted herein in respect of Eligible Existing System Components; or
- Reduce the total number of Gates in an Array, except as expressly permitted in Appendix 2.10.

For those Gate Options associated with the reuse of existing AFC 1.0 Gates, the MBTA will provide specifications to the SI after the Date of Award for the MBTA Fare Gate Interface Controller Board (ICB) necessary for operations that rely on any AFC 1.0 Equipment, as discussed in more detail below. To support the SI's use of such specifications, the MBTA will provide a sample ICB as described in Attachment 2 (MBTA Interface Control Document). The SI will be required to manufacture and utilize the specified ICB in accordance with Attachment 2 (MBTA Interface Control Document). The SI shall not modify the ICB. The MBTA will provide to the SI – at no charge to the SI - the software required for the ICB and the rights to utilize such software.

In the Gate Options described and drawn below, block diagrams use two colors: red and black. Subcomponents and connections shown in red on any block diagram within a Gate Option shall be newly designed and implemented by the SI, and shall not re-use any legacy components of the AFC 1.0 Gates. In the event of any uncertainty in the meaning between the block diagrams and text in the rest of this Section 8, the block diagrams will take precedence.

Any reference to AFC 2.0 in the block diagrams refers to the System. Where the text and diagrams refer to a “2.0 computer”, it means a component of the Customer-Facing Device provided by the SI as part of the System and does not presume a specific implementation or technology.

The actual transition method undertaken by the SI shall be consistent in all respects with the transition method demonstrated as part of the Gate Transition Demonstration described in Appendix 2.16; any deviation from the demonstrated method shall be subject to MBTA review and approval in its discretion.

8.1 Accounting for Existing AFC 1.0 Gates Types

For purposes of the Project, there are two types of AFC 1.0 Gates. Both types of AFC 1.0 Gates are deployed in various configurations (for example, in including accessible widths, and in single and multiple Arrays). The SI shall account for the various configurations in its implementation plan (as defined in Appendix 2.11), and explain how Quantity Standards and Accessibility requirements in particular will be satisfied in the SI's implementation.

A block diagram of each AFC 1.0 Gate's system architecture can be found in the Reference Documents.

8.1.1 Legacy Gate 2

Two Stations (Government Center and Assembly Square) have been outfitted with variants of these AFC 1.0 Gates (“Legacy Gate 2”), and any AFC 1.0 Gates included in a Station identified in Appendix 2.8 as part of the Planned Expansions shall also be treated as Legacy Gate 2 unless the MBTA, in its discretion, approves otherwise. The SI may choose from

any of the Gate Options listed below for replacing/upgrading these Legacy Gate 2 AFC 1.0 Gates.

8.1.2 Legacy Gate 1

All other MBTA Stations with AFC 1.0 Gates have been outfitted with these AFC 1.0 Gates (“Legacy Gate 1”). The SI may choose from any of the Gate Options listed below for replacing/upgrading these Legacy Gate 1 AFC 1.0 Gates.

8.2 Gate Option 1: Complete Gate Replacement

8.2.1 Gate Option 1 is a complete AFC 1.0 Gate replacement. A Proposer choosing this Gate Option shall design and implement completely new Gates, which shall be deployed at Stations to operate in parallel with AFC 1.0 Gates during the Pilots and Transition Period. During the Pilots and Transition Period, Locations shall have both AFC 1.0 Gates (to handle AFC 1.0 Media) and Gates (to handle System Media and, to the extent permitted by the Technical Requirements, AFC 1.0 Media). The SI shall implement this Gate Option in such a way that adequate capacity is made available at all times during the Installation. The Proposer shall explain in detail in its Proposal how the SI will ensure adequate capacity will be maintained and assured for Users throughout every Station throughout the Installation and how User flow will be managed. [PSR: Gate replacement transition plan]

8.2.2 At all times during the Pilots and Transition Period, the SI shall ensure that each Gate Array contains at least the same number of total AFC 1.0 Gates and Gates together as existing AFC 1.0 Gates in each such Array. Because the majority of AFC 1.0 Gates in any given Array operate by means of a computer and controller included in one console controlling portions of the functions of an adjacent console, replacing a pair of AFC 1.0 Gate consoles with Gate components will result in one AFC 1.0 Gate in the Array not being available for Revenue Service. Wherever needed to fulfill the throughput requirements specified in this Appendix 2.3, the SI shall add Gates and shall include applicable requirements in the DB Plans and Specifications for DB Installation Work required to replace any AFC 1.0 Gates made unavailable for Revenue Service during the Pilots and Transition Period.

8.2.3 Each Gate installed pursuant to Gate Option 1 shall:

8.2.3.1 Upon installation, comply with all requirements set forth in Sections 3, 4, 5, and 8 of this Appendix 2.3, except that Sections 3.2.3, 5.1.4-1, 5.1.5, 5.3.1-1, 5.4-2, 5.4-3, 5.6-2(a), 5.6-5, and 5.8 will not be applicable until the time specified in Section 8.2.3.3;

8.2.3.2 Upon installation, to the extent the Proposal indicates that AFC 1.0 Media will be accepted by the Gates (as reflected in Appendix 6 and subject to Appendix 3.3), accept AFC 1.0 Media in accordance with all applicable Contract Standards; and

8.2.3.3 Upon the earlier of (a) the Gate’s use in any Pilot and (b) the Revenue Service Commencement Date, operate to meet all applicable Contract Standards. In the avoidance of doubt, the subset of excluded requirements set forth in Section 8.2.3.1 will be applicable at such time.

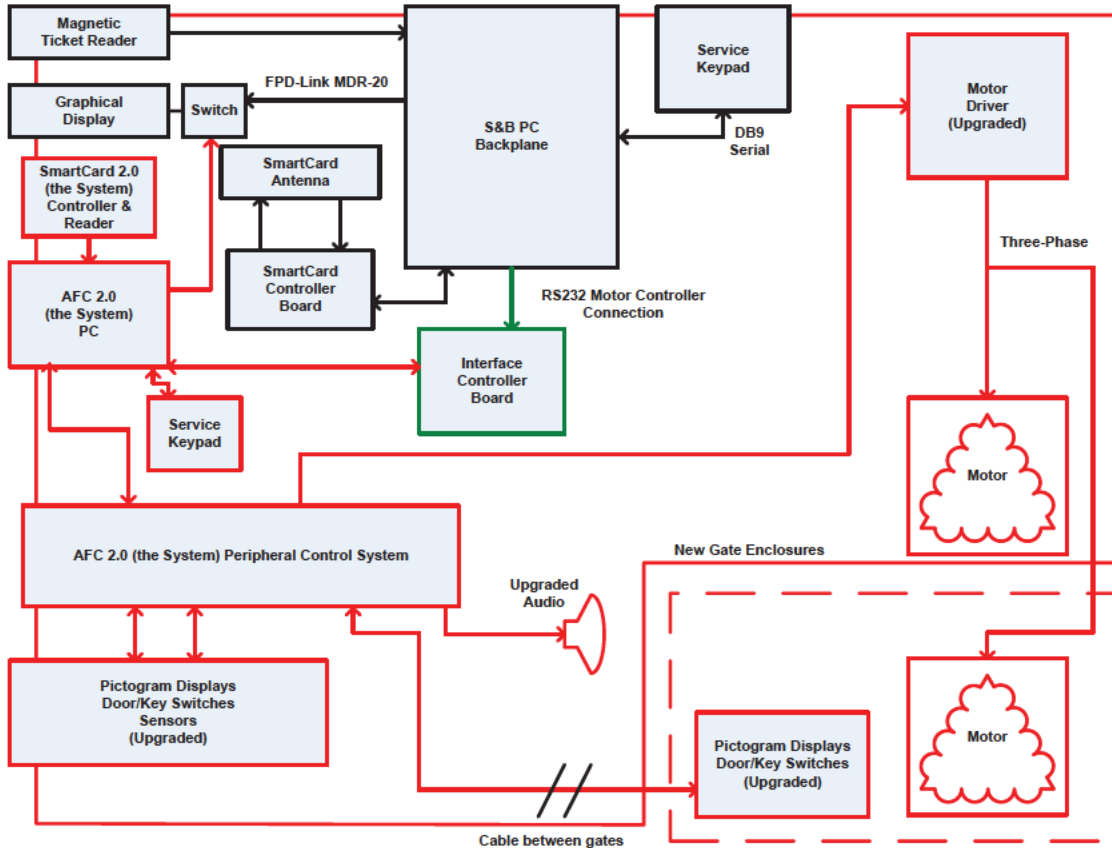
8.2.4 In the event that any Gate fails to comply with any of the requirements set forth in Section 8.2.3.1 (other than the excluded requirements), the MBTA shall have right, by written notice to the SI specifying the failure of compliance, to direct the SI (and the DB Entity) to stop installing Gates pursuant to Gate Option 1 until such time as the SI demonstrates to the reasonable satisfaction of the MBTA that the failure of compliance has been corrected. A

written directive by the MBTA in accordance with this Section 8.2.4 shall not be considered a Supervening Event, and the SI shall be solely responsible for all resulting cost, expense and delay.

- 8.3 Gate Option 2: New Peripheral Controller with New Enclosure/Mechanicals/Motor
- 8.3.1 Gate Option 2 does NOT use the existing AFC 1.0 Gate console enclosures for Gates.
- 8.3.2 In Gate Option 2, new Gate enclosures shall be designed by the SI to fit the new System PC and components, and also incorporate the AFC 1.0 PC, smartcard reader, and magnetic ticket reader. The AFC 1.0 PC shall remain in use during the Pilots and Transition Period to communicate with the legacy AFC 1.0 back office using the AFC 1.0 network. The MBTA will provide specifications for the ICB to simplify communications between the AFC 1.0 PC and System PCs and the peripheral controller. Documentation specifying all inputs and outputs for the ICB are included in Attachment 2 (MBTA Interface Control Document) and detailed design documents and a sample ICB necessary for manufacture of the ICB by the SI will be provided by the MBTA to the SI after the Date of Award. The SI shall utilize the ICB in a manner consistent with Attachment 2 (MBTA Interface Control Document) and shall not modify the ICB.
- 8.3.3 Subject to Section 8.6, each Gate installed pursuant to Gate Option 2 shall:
- 8.3.3.1 Upon installation, comply with all requirements set forth in Sections 3, 4, 5, and 8 of this Appendix 2.3, except that Sections 3.2.3, 5.1.4-1, 5.1.5, 5.3.1-1, 5.4-2, 5.4-3, 5.6-2(a), 5.6-5, and 5.8 will not be applicable until the time specified in Section 8.3.3.4;
- 8.3.3.2 Upon installation, accept AFC 1.0 Media using the AFC 1.0 Equipment identified in Section 8.3.2 through the end of the Transition Period;
- 8.3.3.3 Upon installation, be subject to the requirements set forth in Appendix 4.6 in respect of maintenance of AFC 1.0 Equipment; and
- 8.3.3.4 Upon the earlier of (a) the Gate's use in any Pilot and (b) the Revenue Service Commencement Date, operate to meet all applicable Contract Standards. In the avoidance of doubt, the subset of excluded requirements set forth in Section 8.3.3.1 will be applicable at such time.
- 8.3.4 In the event that any Gate fails to comply with any of the requirements set forth in Sections 8.3.3.1 (other than the excluded requirements), 8.3.3.2, or 8.3.3.3, the MBTA shall have right, by written notice to the SI specifying the failure of compliance, to direct the SI (and the DB Entity) to stop installing Gates pursuant to Gate Option 2 until such time as the SI demonstrates to the reasonable satisfaction of the MBTA that the failure of compliance has been corrected. A written directive by the MBTA in accordance with this Section 8.3.4

shall not be considered a Supervening Event, and the SI shall be solely responsible for all resulting cost, expense and delay.

8.3.5 A Proposer selecting Gate Option 2 must pair it with Second Stage Work defined in Section 8.6.



Gate Option 2: New Peripheral Controller with New Enclosure/Mechanicals/Motor, during Pilots and Transition Period

Note: the post-Transition Period diagram for Gate Option 2 is contained in Section 8.6.

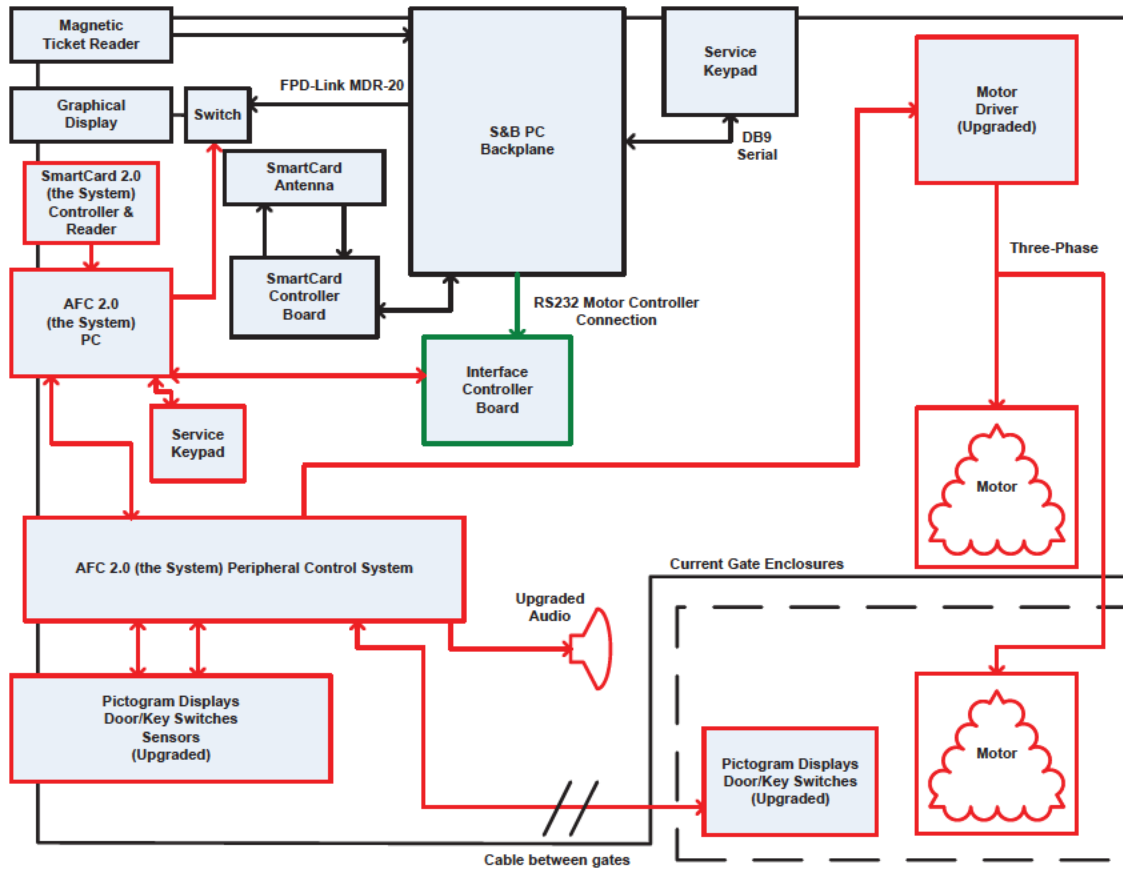
8.4 Gate Option 3: New Peripheral Controller

8.4.1 Gate Option 3 DOES use the existing AFC 1.0 Gate console enclosures for upgraded Gates.

8.4.2 A Proposer choosing Gate Option 3 shall add a new System PC, peripheral controller, and peripherals (including motors) in the existing AFC 1.0 Gate enclosures. Rather than retaining the legacy “AS1300” motor controller and peripherals, the 2.0 PC shall connect to its own 2.0 System controller with new peripherals, which are put into operation immediately during the Pilots and Transition Period. The MBTA will provide specifications for the ICB to simplify communications between the AFC 1.0 PC and System PCs and the peripheral controller. Documentation specifying all inputs and outputs for the ICB are included in Attachment 2 (MBTA Interface Control Document) and detailed design documents and a sample ICB necessary for manufacture of the ICB by the

SI will be provided by the MBTA to the SI after the Date of Award. The SI shall utilize the ICB in a manner consistent with Attachment 2 (MBTA Interface Control Document) and shall not modify the ICB.

- 8.4.3 A Proposer choosing Gate Option 3 shall not re-use any components of the existing AFC 1.0 Gate except the enclosure. AFC 1.0 Gate doors/glass panels shall not be considered part of the enclosure.
- 8.4.4 Subject to Section 8.6, each AFC 1.0 Gate in which any System Element is installed pursuant to Gate Option 3 shall be considered a Gate at the moment of the first such installation, and each such Gate shall:
 - 8.4.4.1 Upon installation, comply with all requirements set forth in Sections 3, 4, 5, and 8 of this Appendix 2.3, except that Sections 3.2.3, 5.1.4-1, 5.1.5, 5.3.1-1, 5.4-2, 5.4-3, 5.6-2(a), 5.6-5, and 5.8 will not be applicable until the time specified in Section 8.4.4.4;
 - 8.4.4.2 Upon installation, accept AFC 1.0 Media using the AFC 1.0 Equipment identified in Section 8.4.2 through the end of the Transition Period;
 - 8.4.4.3 Upon installation, be subject to the requirements set forth in Appendix 4.6 in respect of maintenance of AFC 1.0 Equipment; and
 - 8.4.4.4 Upon the earlier of (a) the Gate's use in any Pilot and (b) the Revenue Service Commencement Date, operate to meet all applicable Contract Standards. In the avoidance of doubt, the subset of excluded requirements set forth in Section 8.4.4.1 will be applicable at such time.
- 8.4.5 In the event that any Gate fails to comply with any of the requirements set forth in Sections 8.4.4.1 (other than the excluded requirements), 8.4.4.2, or 8.4.4.3, the MBTA shall have right, by written notice to the SI specifying the failure of compliance, to direct the SI (and the DB Entity) to stop installing Gates pursuant to Gate Option 3 until such time as the SI demonstrates to the reasonable satisfaction of the MBTA that the failure of compliance has been corrected. A written directive by the MBTA in accordance with this Section 8.4.5 shall not be considered a Supervening Event, and the SI shall be solely responsible for all resulting cost, expense and delay.
- 8.4.6 A Proposer selecting Gate Option 3 must pair it with Second Stage Work defined in Section 8.6.



Gate Option 3: New Peripheral Controller, during Pilots and Transition Period

Note: the post-Transition Period diagram for Gate Option 3 is contained in Section 8.6.

8.5 Gate Option 4: Upgrading Existing Gates – Legacy Peripheral Controller

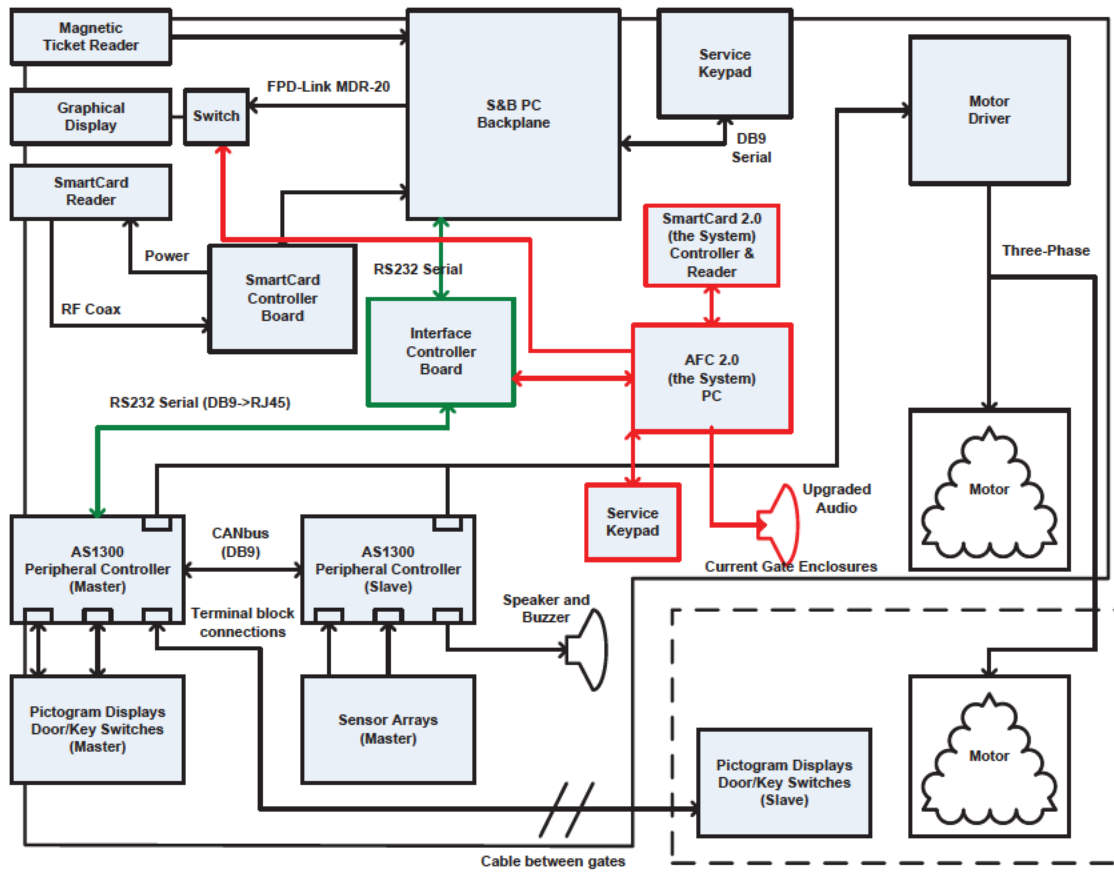
8.5.1 Gate Option 4 DOES use the existing AFC 1.0 Gate console enclosures.

8.5.2 A Proposer choosing Gate Option 4 shall retain the existing AFC 1.0 Gate enclosures, peripherals, and peripheral controller. A new System PC and Reader shall be added to the existing AFC 1.0 Gates. The MBTA will provide specifications for the ICB to simplify communications between the AFC 1.0 PC and System PCs and the peripheral controller. Documentation specifying all inputs and outputs for the ICB are included in Attachment 2 (MBTA Interface Control Document) and detailed design documents and a sample ICB necessary for manufacture of the ICB by the SI will be provided by the MBTA to the SI after the Date of Award. The SI shall utilize the ICB in a manner consistent with Attachment 2 (MBTA Interface Control Document) and shall not modify the ICB.

8.5.3 Subject to Section 8.7, the SI shall, for each AFC 1.0 Gate in or on which any System Element is installed pursuant to Gate Option 4:

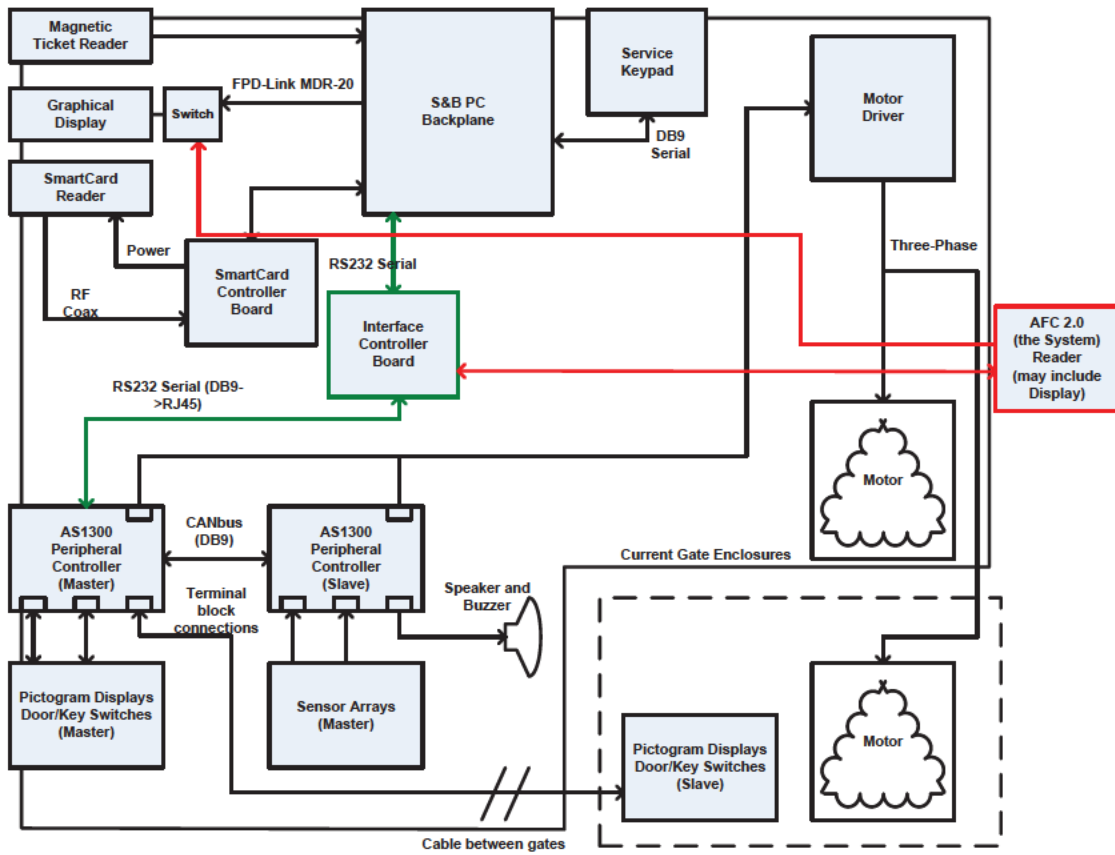
8.5.3.1 Ensure that neither the System Elements nor the Installation create any safety or security hazard;

- 8.5.3.2 Upon installation, permit the AFC 1.0 Gate to continue to accept AFC 1.0 Media using the AFC 1.0 Equipment identified in Section 8.5.2 through the end of the Transition Period;
 - 8.5.3.3 Upon installation, comply with the requirements set forth in Appendix 4.6 in respect of maintenance of AFC 1.0 Equipment; and
 - 8.5.3.4 Upon the earlier of (a) the AFC 1.0 Gate's use in any Pilot and (b) the Revenue Service Commencement Date, cause the System Elements installed in the AFC 1.0 Gate, collectively, to comply with all requirements set forth in the following Sections of this Appendix 2.3: 3.2.3, 3.2.4, 3.4, 3.6, 3.7, 3.8.1, 3.8.2, 3.9, 3.10, 3.11, 3.12, 3.13 (except that stickers are acceptable in this instance), 4.1-8, 4.2, 5.1.4, 5.3.1-3, 5.3.2, 5.3.4, 5.4, 5.6-1, 5.6-5, 5.7-1 and 5.8.
- 8.5.4 For purposes of the Key Performance Indicators and associated Deductions, the System Elements installed in or on an AFC 1.0 Gate as part of Gate Option 4 shall collectively be treated as a Station Validator and not as a Gate until the time specified in Section 8.7.2.
- 8.5.5 In the event that the SI fails to comply with any of the requirements set forth in Sections 8.5.3.1, 8.5.3.2 or 8.5.3.3, the MBTA shall have right, by written notice to the SI specifying the failure of compliance, to direct the SI (and the DB Entity) to stop installing Gates pursuant to Gate Option 4 until such time as the SI demonstrates to the reasonable satisfaction of the MBTA that the failure of compliance has been corrected. A written directive by the MBTA in accordance with this Section 8.5.5 shall not be considered a Supervening Event, and the SI shall be solely responsible for all resulting cost, expense and delay.
- 8.5.6 As part of Gate Option 4, the SI may add System Elements onto the exterior of the AFC 1.0 Gate enclosure but must ensure the integrity, security, and durability of the gate is not negatively impacted by such a modification, and the modification must comply with all applicable Contract Standards relating to Accessibility.
- 8.5.7 A Proposer selecting Gate Option 4 must pair it with Second Stage Work defined in Section 8.7.



Gate Option 4: Legacy Peripheral Controller, during Pilots and Transition Period

Note: the post-Transition Period diagram for Gate Option 4 is contained in Section 8.7.



Gate Option 4: Legacy Peripheral Controller, during Pilots and Transition Period, with Enclosure Alternative

Note: the post-Transition Period diagram for Gate Option 4 is contained in Section 8.7.

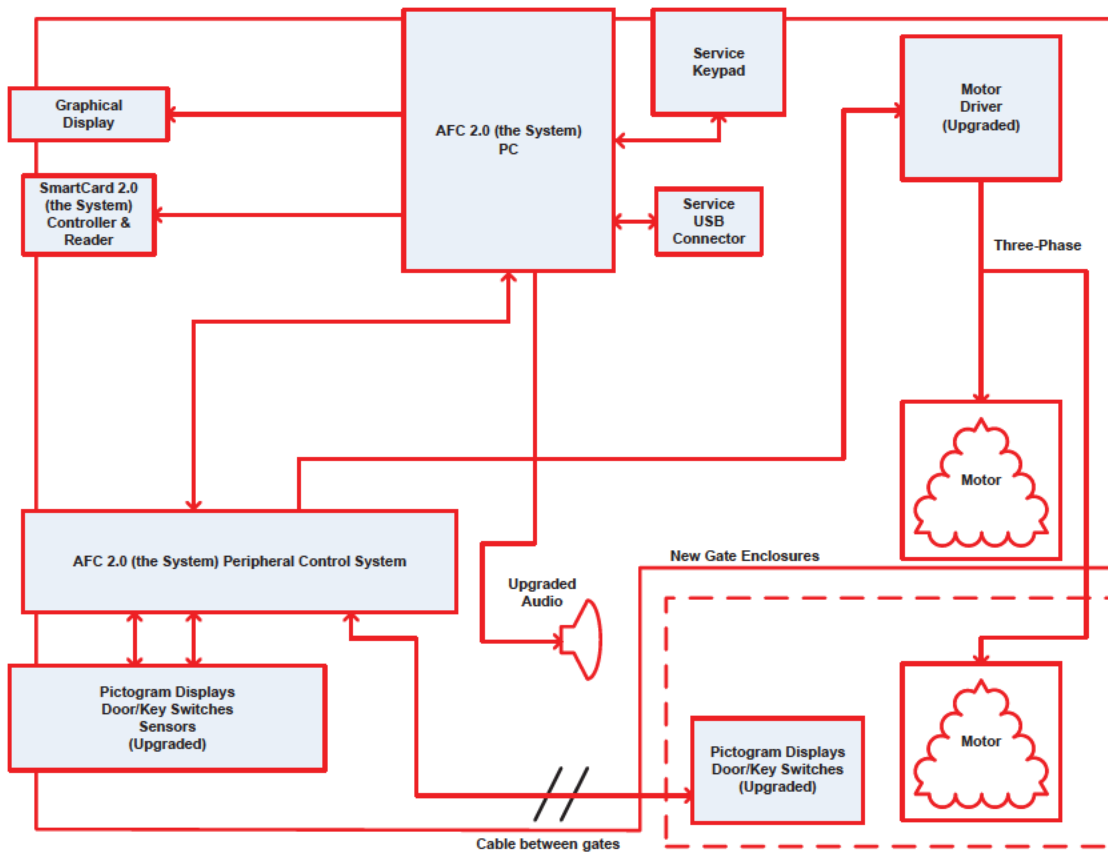
8.6 Second Stage Work for Gate Option 2 and 3

8.6.1 For each Gate installed pursuant to Gate Option 2 or Gate Option 3, the SI shall bring about the following configurations as a condition to the Full Service Commencement Date, directly and by including all applicable requirements in the DB Plans and Specifications:

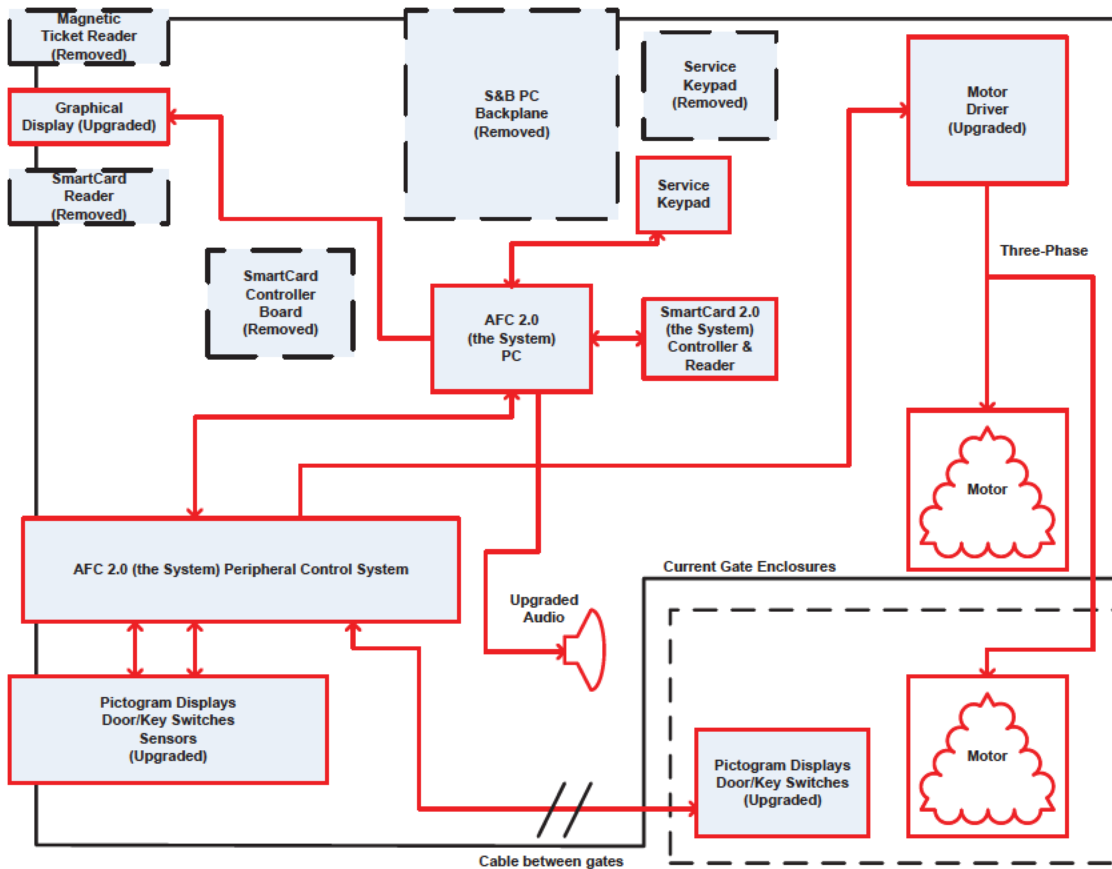
8.6.1.1 Configurations as illustrated in the diagrams below for each such Gate (removing any and all AFC 1.0 Equipment); or

8.6.1.2 Implement Gate Option 1 for each such Gate.

The Proposal shall identify which of such approaches the Proposer will take. [CDRL: Gate Option selection]



Gate Option 2, Post-Transition Period



Gate Option 3, Post-Transition Period

8.7 Second Stage Work for Gate Option 4

8.7.1 For each AFC 1.0 Gate for which the SI has implemented Gate Option 4, the SI shall bring about the following configurations, as a condition of the Full Service Commencement Date, directly and including by accounting for all necessary DB Installation Work in the DB Plans and Specifications:

- 8.7.1.1 Configurations as illustrated in the diagram below for each such AFC 1.0 Gate (removing any and all AFC 1.0 Equipment); or
- 8.7.1.2 Implement Gate Option 1 for each such AFC 1.0 Gate.

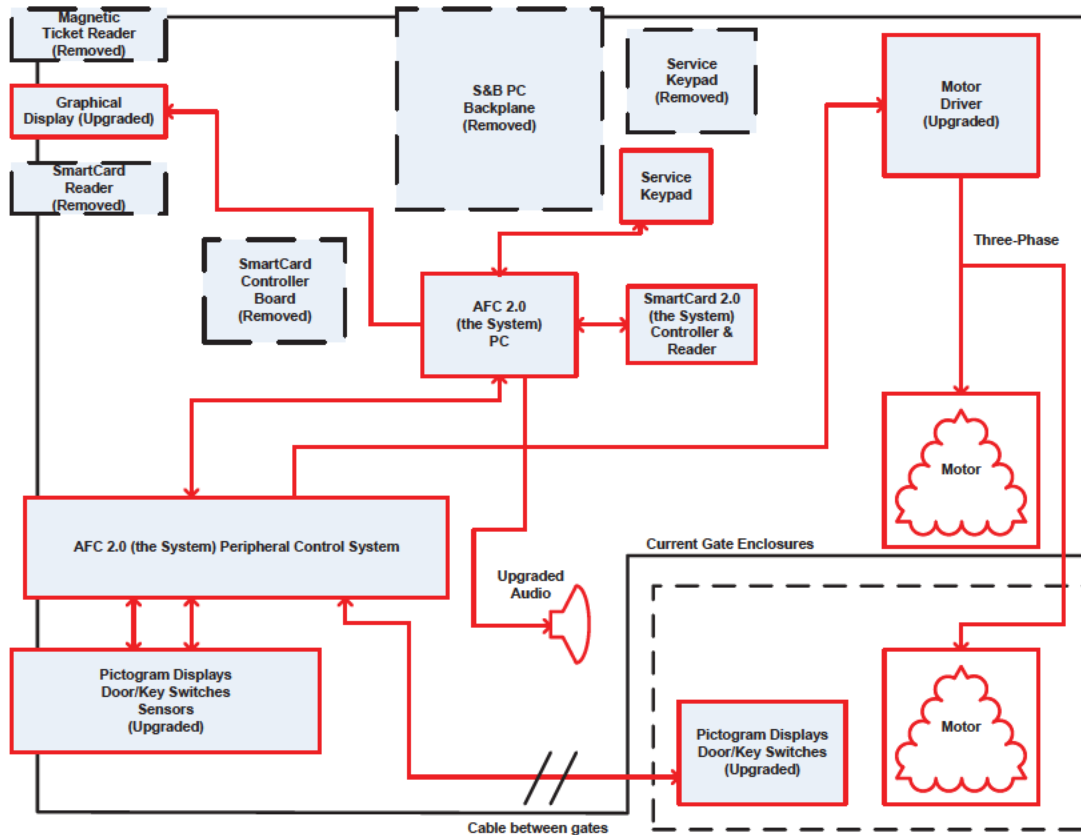
The Proposal shall identify which of such approaches the Proposer will take. [CDRL: Gate Option selection]

8.7.2 Without limiting the requirements of Section 8.7.1, for each AFC 1.0 Gate for which the SI has implemented Gate Option 4, such AFC 1.0 Gate on which a System Element is installed shall be considered a Gate rather than a Station Validator, and the SI shall be responsible for compliance with all Contract Standards (including the Key Performance Indicators) for each Gate, on the earlier of:

- 8.7.2.1 The date when the Second Stage Work described in Section 8.7.1 is performed;
- and

8.7.2.2 The Scheduled Full Service Commencement Date.

- 8.7.3 No Gate described in 8.7.2 shall re-use any component of the former AFC 1.0 Gate except the enclosure. AFC 1.0 Gate doors/glass panels shall not be considered part of the enclosure.



Gate Option 4, Post-Transition Period

9. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.3. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein.

The topics covered in this Appendix 2.3 are split between the team experience Submittal described in Appendix 2.7 and the one described in Appendices 2.4, 2.8, 2.12, 2.13, 2.14, 2.16 and 5. [PSR: Proposer team experience: Devices (except gate transition)] [PSR: Proposer team experience: Implementation, expansion, DB oversight and testing]

APPENDIX 2.4

MODEL OFFICE

The SI shall build and make available to the MBTA a complete, accurate model version of the System for the purpose of simulating and testing System functions. The Model Office shall use simulated, non-production Data, Media, and revenue.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.4 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Model Office plans]

1. Spaces

The Model Office shall include: a physical space (the MO Physical Space), a vehicle-borne space (the Mobile Model Office), a non-revenue station, an API test environment, and a satellite project office.

1.1 Physical Space

The Model Office shall include physical space (the MO Physical Space) located on non-MBTA property within 0.25 mile (by a walking route) of one of the following MBTA stations: Haymarket, Charles MGH, Downtown Crossing, South Station, State, Government Center, Bowdoin, North Station, Park, Boylston, Arlington, Tufts Medical Center, Back Bay, Copley, Aquarium or Hynes. Attachment 1 (Model Office map) contains a map showing possible locations.

- 1.1.1 The MO Physical Space and paths to it shall be readily accessible to and usable by persons with disabilities and shall comply with Applicable Accessibility Law.
- 1.1.2 The SI shall identify the location, provide directions, and provide Documentation of accessible paths to the MO Physical Space within ninety (90) days of the Effective Date. [CDRL: Model Office location]
- 1.1.3 The MO Physical Space shall be accessible by MBTA Persons 24 hours per day, 7 days per week. The SI shall also provide access to the Independent Certifier as described in Section 6.8 of the Project Agreement.
- 1.1.4 At all times, the MO Physical Space shall contain at least one of (1) all installed Devices, (2) every Device proposed for installation, (3) every Variant of any Device either installed at any Location or on any Vehicle or proposed for installation at any Location or on any Vehicle, and (4) the Reader API demonstration implementation set forth in Appendix 3.9. Once a Device or Variant is no longer installed at any Location or on any Vehicle, it shall be removed from the MO Physical Space. In planning and selecting the location of the MO Physical Space, the SI shall take into account this requirement; if more room is needed during the Term to satisfy this requirement, the SI shall relocate the MO Physical Space.
- 1.1.5 All System Elements in the MO Physical Space shall be connected to the Communications Network (as defined in Appendix 2.5). The Devices and the Communications Network established in the MO Physical Space shall operate in such a way as to accurately simulate the operation of the rest of the System.
- 1.1.6 The SI shall make available at the MO Physical Space, all Documentation required by section 6.3 of the Project Agreement.
- 1.1.7 The MO Physical Space shall include Payment Card processing, System Website and Customer Support Software functionality, APIs, and non-production versions of any cloud

services used by the System. The MO Physical Space shall include computers and multiple mobile devices able to access these System Elements as described further later in this Appendix 2.4.

- 1.1.8 The MO Physical Space shall include non-revenue Computation Reports as described in Appendix 4.2.
 - 1.1.9 The MO Physical Space shall include a retail point of sale terminal that replicates the functionality of retail point of sale terminals at Retail Reload Locations and Administrative Point of Sales.
 - 1.1.10 The SI shall ensure that the Gate Array at the MO Physical Location is available as part of the Gate Transition Demonstration described in Appendix 2.16. If the SI's selected Gate Option uses AFC 1.0 Gates, the MBTA will provide Legacy Gate 1 AFC 1.0 Gates for the MO Physical Space.
 - 1.1.11 The MO Physical Space shall include restroom facilities.
 - 1.1.12 The Proposal shall provide sketches of the layout of the MO Physical Space including labels of the included System Elements and other required components. [PSR: Model Office plans]
- 1.2 Vehicle-Borne Space
- The Mobile Model Office shall be implemented by the SI in an enclosed, mobile, vehicle-borne space in a truck, van, or similar vehicle for use by the MBTA in demonstrating the System for training and outreach purposes.
- 1.2.1 The Mobile Model Office shall consist of a subset of System components as the MBTA may specify, including at least one each of the following: Full-Functionality Fare Vending Machine, Limited-Functionality Fare Vending Machine (if the SI elects to provide a Limited-Functionality FVM), Station Validator, and Vehicle Validator. During Final Design Review, the Devices in the Model Office shall be the prototypes delivered as part of Final Design Review. Upon approval of the final design, Devices shall be updated. At all times throughout the Term, each Device in the Mobile Model Office shall be the latest version of such Device as installed in the System.
 - 1.2.2 The Mobile Model Office shall also include Communications Network architecture, cash handling functionality, Payment Card processing, System Website and Customer Support Software functionality.
 - 1.2.3 The vehicle shall be registered and titled in Massachusetts to the SI.
 - 1.2.4 The vehicle shall be able to be operated by someone with a Massachusetts Class D or other state equivalent driver's license (for vehicles less than 26,000 lbs. gross weight).
 - 1.2.5 The SI shall provide the MBTA with instructions and keys to drive and use the vehicle. As between the SI and the MBTA, the MBTA is solely responsible for ensuring that the vehicle is driven only by MBTA Persons with an applicable and valid driver's license. [CDRL: Vehicle instructions and keys]
 - 1.2.6 The SI shall install a promotional vehicle wrap to support the MBTA brand and rollout campaign, based on artwork supplied by the MBTA. The SI shall provide specifications for vehicle wrap artwork to the MBTA and shall account for artwork turnaround time from the MBTA in its schedule. The SI will only be required to install a single vehicle wrap. [CDRL: Specifications for vehicle wrap artwork]
 - 1.2.7 The SI shall garage the vehicle and deliver it to the MBTA at an address in the MBTA Service Area of the MBTA's choosing on demand upon five (5) business days' notice from the MBTA and within one (1) hour of the time indicated in said notice.
 - 1.2.7.1 As between the SI and the MBTA, the MBTA is solely responsible for costs associated with parking/storage when the vehicle is not in the SI-provided garage space and fuel when the vehicle is in use by the MBTA.

1.2.7.2 The Proposal shall describe how the SI plans for Mobile Model Office availability and access. [PSR: Model Office plans]

1.3 Non-Revenue Station Space

The MO Non-Revenue Station shall be implemented by the SI and shall include a Gate Array and a Full-Functionality Fare Vending Machine at a non-revenue station.

1.3.1 The location for the MO Non-Revenue Station will be provided by the MBTA.

1.3.2 The SI shall extend the Communications Network to the MO Non-Revenue Station (as defined in Appendix 2.5). Even if MBTA Layer 2 Services are available at or near the location of the MO Non-Revenue Station, the SI may not use MBTA Layer 2 Services to extend the Communications Network to the MO Non-Revenue Station.

1.3.3 The MO Non-Revenue Station shall be included in the DB Plans and Specifications as a Location.

1.3.4 The SI shall provide all Operating Services for the MO Non-Revenue Station as are required in the Contract Standards for the equivalent Devices at other Locations and Vehicles, including cash servicing.

1.3.5 The SI shall ensure that the Gate Array at the MO Non-Revenue Station is available as part of the Gate Transition Demonstration described in Appendix 2.16. If the SI's selected Gate Option uses AFC 1.0 Gates, the MBTA will provide Legacy Gate 1 AFC 1.0 Gates for the MO Non-Revenue Station.

1.4 API Test Environment

The Model Office shall include an API test environment as described in Appendix 3.9.

1.4.1 The Proposal shall include a description of how the APIs will be made available for testing through the Model Office and capable of simulating payment transactions without actually deducting any money. [PSR: API testing approach]

1.5 Satellite Project Office

The SI shall provide 1000 sq feet of class B office space, adjacent to the Model Office and furnished with workstation furniture for use by MBTA Persons. The office space shall include WiFi access for MBTA Persons.

2. Availability

2.1 The SI shall make available the MO Physical Space prior to Final Design Review for Devices, and continue to make available the Model Office throughout the Term. The adjacent satellite project office shall be made available starting from functional and performance tests (described in Appendix 2.16), during Pilots (described in Appendix 5.3) and the Transition Period and until three (3) months after the Full Service Commencement Date.

2.2 The SI shall make available the Mobile Model Office starting 30 days prior to the Installation Commencement Date and continue to make available the Mobile Model Office until one (1) year after the Full Service Commencement Date.

2.2.1 Upon completion of the Mobile Model Office availability period, the vehicle will be returned to the SI.

2.3 Baseline System configuration (including MBTA Fare Policy) shall be available in the Model Office starting 30 days prior to the Installation Commencement Date in the proposed configuration mode described in Section 4.2 of this Appendix 2.4. The production configuration mode described in Section 4.1 of this Appendix 2.4 shall be available prior to Pilots.

- 2.4 Once made available, the Model Office may not be used by the SI for the SI's own internal testing or other work, except:
- 2.4.1 For tests and demonstrations that the SI is performing for the MBTA (e.g. to demonstrate compliance with a requirement or demonstrate that a Problem has been resolved) for which the MBTA has been given adequate notice and the opportunity to attend.
 - 2.4.2 With advance MBTA approval, subject to the MBTA's right to revoke such approval, whereupon the SI shall cease such use within four (4) business hours' notice.

3. Functionality

- 3.1 The Model Office shall not handle actual revenue or financial transactions, using instead specially issued Payment Cards provided by the SI and payment processing networks provided by the SI for testing purposes, and an alternative to cash provided by the SI that exhibits similar characteristics. The SI may alternatively propose to use actual cash.
- 3.1.1 If the SI proposes to use actual cash in the Model Office, the Proposal shall explain how a cash pool will be maintained securely at each Model Office space by the SI for use at all times by the MBTA. [PSR: Model Office plans]
- 3.2 The Model Office may not interact in any way with the rest of the System, except for purposes of refreshing the data and configuration used in the Model Office as defined in Section 4 of this Appendix 2.4. The Model Office and its Communications Network shall provide the same level of isolation between the System Website and APIs in the MO Physical Space and other System Elements as described in Appendix 3.1.
- 3.2.1 The Proposal shall explain how the SI will ensure no data flows between the Model Office and the System in Revenue Service and how the SI will provide for isolation among network elements within the Model Office. [PSR: Model Office plans]
- 3.3 In addition to the Devices noted above, the Model Office shall include MO Access Devices including workstations, laptops, tablets, and smartphones to allow access to the System Website, Administrator Interface, Customer Support Software, and the APIs.
- 3.3.1 The MO Access Devices shall be loaded with necessary COTS software (such as operating systems and web browsers) to represent common MBTA User configurations (as identified in the browser and OS support matrix required in Appendix 3.8).
 - 3.3.2 The SI shall operate, Update, Upgrade and maintain all aspects of the MO Access Devices as needed to maintain an accurate simulation of the System, and shall comply with all requirements of Appendix 3.1.
 - 3.3.3 MO Access Devices in the MO Physical Space shall include all the supported platforms defined in Appendix 2.6 and Appendix 3.8.
 - 3.3.4 The MO Physical Space shall allow MBTA to bring computers and laptops to connect to and use the APIs.
- 3.4 The Model Office shall replicate the way System Elements are positioned in Stations and Vehicles as accurately as possible, including, for example, marking out floor clearance that will actually be available on Vehicles near Validators.

4. Modes of Operation

The Model Office shall be able to operate in any of the following three modes. The SI shall Configure the Model Office to run on any of the following modes within eight (8) business hours' notice from the MBTA. The Proposal shall describe how the SI will update the configuration modes and Obfuscate data for that purpose, ensuring that no PII is present in the Model Office. [PSR: Model Office plans]

4.1 Production Configuration Mode

The production configuration mode shall replicate the System configuration then being used in MBTA Revenue Service. The SI shall ensure at all times that the production configuration mode is updated and refreshed to use actual MBTA System configurations. The production configuration mode shall operate on a fully Obfuscated subset of transaction and customer details that comprise at least 25% of the volume of data in the System in Revenue Service. As described further in Appendix 3.1A, no PII may be contained in the Model Office.

4.2 Proposed Configuration Mode

The proposed configuration mode shall replicate the System as it would run on any SI software, hardware, configuration or other changes that are planned or proposed but not yet activated, including software patches, new Fare Policy, new hardware versions, and as described in Appendix 4.3.

4.3 Sample/Reference Configuration Mode

The sample/reference configuration mode shall be a hypothetical transportation network created by the SI with sample Configuration and transactions to sufficient to demonstrate System functionality. This mode will, for example, have fictional Product names, User Profiles, Transportation Services, and Fare Policy.

5. Maintenance and Support

5.1 The SI may perform preventative maintenance on the Model Office (for example, to add new versions of Devices) consistent with the requirements in Appendix 4.6. Notwithstanding the limit on scheduled downtime in Appendix 4.6, the total allowable time during which the Model Office can be unavailable for preventative maintenance may equal but shall not exceed 5.0% of total possible availability.

5.2 The SI shall provide technical support services to maintain the Model Office and assist the MBTA in using the Model Office, including providing the MBTA with all Documentation, training, telephone support, and on-site support as the MBTA may require. Such technical support services shall be customized to the use of the Model Office as opposed to the System.

5.2.1 The technical support Documentation shall include extensive written explanations of the sample/reference configuration mode described above, including identifying all the Accounts, Products, policy configurations available in the reference data sets used in that configuration. [CDRL: Model office technical support Documentation]

5.2.2 The Proposal shall include a description of the support the SI will provide for the Model Office. [PSR: Model Office plans]

5.3 The SI shall provide Media for use in the Model Office corresponding to all types of Media that the System is required to accept. Media provided by the SI for use in the Model Office shall not be accepted for use outside the Model Office.

6. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.4. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.3, 2.8, 2.12, 2.13, 2.14, 2.16 and 5. [PSR: Proposer team experience: Implementation, Expansion, DB Oversight and Testing]

APPENDIX 2.5

COMMUNICATIONS NETWORKS

The Systems Integrator shall provide, as part of the System, a Communications Network (CN) that connects and exchanges Data among all Locations, Vehicles and System Elements in order to meet the requirements of the Contract Standards. The Systems Integrator shall also make available a non-production Communications Network to serve the same function for the Model Office and all of its supporting services and networks. Except as described in this Appendix 2.5 regarding MBTA Layer 2 Services, the MBTA expects the SI will need to manage and pay for the implementation and operation of new data communication services (wired or wireless) for every Project Location and every Vehicle where a Device will be installed.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.5 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Communications Networks general approach]

1. Scope of the Communications Network

The CN shall include all CN Equipment and CN Services necessary to connect and exchange Data between and among all of the following MBTA and System components:

- 1.1 All Stations where System Elements will be installed, including Rapid Transit, Commuter Rail and Light Rail stations.
- 1.2 All Devices wherever located, including Devices at Stations, non-Station Locations (including all Stops), and Devices placed on Vehicles.
 - 1.2.1 No data communication cables may be added to or used in Vehicles as part of the CN without MBTA approval (acting reasonably), except to the extent permitted in Appendix 2.12 in respect of antennas and to the extent permitted by Section 4.2.2 below.
 - 1.2.2 CN access consolidation devices (e.g. mobile access routers) may be placed on Vehicles as CN Equipment, but must connect wirelessly to Devices on the Vehicle.
- 1.3 All bus garages and Light Rail carhouses, for communication with Devices on Vehicles based or parked at those Locations, subject to the following:
 - 1.3.1 If the System can successfully meet all Contract Standards relating to Device communication without installing any CN Equipment at bus garages and Light Rail carhouses (for example, using the Verizon/MBTA Contract CN Services), then no such CN Equipment is necessary at those Locations.
 - 1.3.2 If, however, the System cannot meet all Contract Standards without augmenting the CN Services (for example, if Devices on Vehicles parked in a bus garage overnight cannot communicate with other System Elements), then the SI shall install such CN Equipment in bus garages and Light Rail carhouses as is necessary to meet all Contract Standards.
- 1.4 The Retail Reload Locations in respect of Data interfaces thereto.

- 1.5 The Application Program Interfaces and Account Management Interfaces (as defined in Appendix 3.8), so that the required functionality of these services are available to the MBTA and to two off-site MBTA contract-operated service centers at the direction of the MBTA.
- 1.6 All Payment Service Providers.
- 1.7 Any SI data centers, offices, warehouses, subcontractor facilities, and any other SI-controlled or direct location or service that is required to be connected in order for the System to be fully Available.
- 1.8 External Interfaces, as defined in Appendix 3.10, and the Federated Identity Services defined in Appendix 3.1B, which shall be available to the MBTA.
 - 1.8.1 The SI must propose how the External Interfaces and Federated Identity Services will be made available on the MBTA network and provide preliminary instructions for MBTA to modify its computers, servers, and networks while maintaining compliance with Appendix 3.1. [PSR: Explanation of System interface availability]

2. Expansion to Other Parties Through Options

The CN shall be capable of expansion to serve Regional Transit Providers in accordance with Article 12 of the Project Agreement.

3. Web-Based System Elements

The System shall use the CN to make the System Website, Application Programming Interfaces (APIs), and the Administrator Interface available to Users on the Internet, subject to the User eligibility requirements for each in Appendix 3.8 and the access control requirements in Appendix 3.1.

4. General Characteristics of the CN

- 4.1 Any switches, routers, and equivalent physical and virtual devices made part of the CN (except any such devices used on Vehicles) must be Cisco Systems, Inc. products or an MBTA-approved alternate. No alternate will be accepted at the time of the Proposal. [CDRL: Proposed alternate for CN devices]
- 4.2 The SI shall not use any existing or future MBTA wired or wireless network as part of the CN except:
 - 4.2.1 As specifically permitted in Section 6 of this Appendix 2.5; and
 - 4.2.2 In respect of on-Vehicle networks used to monitor Vehicle status and attributes, but (i) any use of such networks is only allowed as and if specifically allowed by the MBTA and is subject to Design Review as described in Appendix 7, and (ii) no PII shall be allowed to flow over or be accessed via such networks in any circumstance.
- 4.3 The CN shall not allow Data to flow between any existing or future MBTA or RTP network and the CN except as specifically permitted in Appendix 3.10, Appendix 3.1B, and Section 1.8 of this Appendix 2.5.
- 4.4 The SI shall include the CN within its PCI-SSC Report on Compliance (ROC) scope as defined in Appendix 3.1. The SI shall obtain PCI-SSC attestations of compliance and/or ROCs from all service providers. The MBTA will not provide any PCI-SSC services or attestations of compliance to the SI relating to any use of the MBTA Layer 2 Services. The SI shall provide such attestations of compliance and /or ROCs from service providers and operators of connected networks along with any ROC submitted to the MBTA. [CDRL: ROC attestations]

- 4.5 The SI shall ensure that CN Equipment placed at a Location does not interfere with existing non-System facilities and components at such Location. For example, the SI must plan for and confirm availability of power and rack space wherever CN Equipment is placed, and may not remove or alter any non-SI components.
- 4.6 Optional Use of the Commonwealth Contract with Verizon
The SI may contract separately for all CN Services or utilize the existing Commonwealth contract with Verizon (state blanket contract ITT46, the “Verizon/MBTA Contract”) to provide for CN Services. Any use of the Verizon/MBTA Contract is subject to the following:
- 4.6.1 For all Locations and Devices, the SI may use Verizon services provided in the “Custom 4G On Net Machine to Machine (M2M) Share Plans for COMA” section of Attachment 3 (Addendum 6 to Verizon/MBTA Contract), to fulfill portions of the CN requirement, subject to the terms and conditions of the Verizon/MBTA Contract, including the pricing terms set forth therein.
- 4.6.2 The SI is responsible for assessing and verifying the suitability of the Verizon/MBTA Contract to fulfill CN requirements.
- 4.6.3 The SI must identify in its Proposal what CN Services will be provided through the Verizon/MBTA Contract. [PSR: Verizon/MBTA contract choice]
- 4.6.4 The SI will work directly with Verizon as an MBTA-authorized administrator to place orders, manage projects, activate and deactivate services, track and manage equipment, submit and track trouble tickets, and review network usage and bills.
- 4.6.5 In ordering and using services from Verizon under the Verizon/MBTA Contract, the SI shall work with Verizon to ensure that SI-ordered services are accounted for in a way that distinguishes them from other Verizon services provided to the MBTA, including, as practicable, by providing separate bills.
- 4.6.6 The MBTA will provide the SI with a copy of each Verizon bill that requires payment for CN Services. The SI shall pay to the MBTA the Verizon Monthly Service Fees: the full amount of all Verizon bills attributed to the CN Services, including all orders placed by the SI, by wire transfer or ACH, no later than the due date of each bill; provided that, commencing with the first Monthly Invoice following the Revenue Service Commencement Date, the SI shall instead deduct such amount from each Monthly Invoice in accordance with Appendix 8 (Payment Mechanism) and Article 10 (Payments) of the Project Agreement. [CDRL: Copy of Verizon bill]
- 4.6.7 If the SI disagrees with any part of a bill from Verizon, the SI must document that dispute in writing with supporting details and Documentation, submit it to Verizon and copy the MBTA. The fact that the SI has disputed any bill from Verizon shall not relieve the SI of its obligation to pay the MBTA the full amount of the Verizon bill while the dispute is pending. If the SI is unsuccessful in resolving a good faith bill dispute within 45 days of its submission, the MBTA, at the request of the SI, will use reasonable efforts to assist the SI in resolving the dispute with Verizon. Any refund provided to the MBTA by Verizon in connection with the resolution of such a dispute and attributable to CN Services shall be for the account of the SI. [CDRL: Documentation of dispute with Verizon]
- 4.6.8 The SI will be entitled to the Verizon Credit Amount (Index Linked) against payments to Verizon under the Verizon/MBTA Contract (up to \$360,000 (Index Linked) per year) if the SI maintains the Minimum Verizon Devices for that month with Verizon as part of the CN, provided that the devices are unique active wireless devices and subject to the terms and conditions of the Verizon/MBTA Contract. The SI shall report the total number of unique Verizon wireless devices active during the Month as Total Active Verizon Accounts.
- 4.6.9 The SI acknowledges that the Verizon/MBTA Contract is subject to expiration and renewal during the Term and agrees that it may not opt out of using the Verizon/MBTA Contract as long as it remains in place. The MBTA shall use all reasonable efforts to provide the SI

- with reasonable advance written notice of any expected change in the terms and conditions of the Verizon/MBTA Contract, including any decision not to renew the Verizon/MBTA Contract.
- 4.6.10 Any early termination (excluding termination due to Systems Integrator Fault) or expiration without renewal of the Verizon/MBTA Contract at any time during the Term shall be a Compensation Event; provided that, if the MBTA provides not less than ninety (90) days' advance notice of any such early termination or expiration without renewal, the Systems Integrator shall be entitled to the Change in Costs associated with contracting separately for CN Services (to the extent such services were previously provided under the Verizon/MBTA Contract) but shall not be entitled to any relief from its performance obligations hereunder due to any such Compensation Event.
- 4.6.11 A material increase in pricing under the Verizon/MBTA Contract (excluding any increase due to additional services required by the Systems Integrator or any increase due to Systems Integrator Fault) shall be a Compensation Event; provided that:
- 4.6.11.1 No material increase shall be deemed to have occurred if the applicable pricing is within five percent (5%) of the applicable pricing in effect as of the Date of Award, as adjusted by the Inflation Index from the Date of Award through the date of determination; and
- 4.6.11.2 The relief to be provided to the Systems Integrator in circumstances of a material increase in price shall be limited to compensation in the amount of such material increase, and the Systems Integrator shall not be entitled to any relief from its performance obligations hereunder due to any such Compensation Event.
- 4.7 The SI shall provide administrator credentials for all network devices at Locations to the MBTA [CDRL: Administrator credentials for network devices]:
- 4.7.1 as and to the extent necessary to support any MBTA Step-in Action pursuant to Section 21.5 of the Project Agreement; and
- 4.7.2 upon the expiration or any termination of this Project Agreement.
- 4.8 Configuration files for all network devices at Locations shall be stored securely and backed up, and shall be provided to the MBTA [CDRL: Configuration files for network devices]:
- 4.8.1 as and to the extent necessary to support any MBTA Step-in Action pursuant to Section 21.5 of the Project Agreement; and
- 4.8.2 upon the expiration or any termination of this Project Agreement.
- 4.9 The SI shall develop and maintain detailed physical and logical network drawings of the CN, including architecture, endpoints, fiber and cable runs, equipment identification, physical and virtual addresses, and physical locations, in accordance with Good Industry Practice and shall provide such drawings to the MBTA prior to the Installation Commencement Date, upon request at any time during the Term, and upon the expiration or any early termination of this Project Agreement. [CDRL: Detailed physical and logical network drawings]
- 4.10 The Proposal shall provide conceptual network drawings for the CN and each location type listed in this Appendix 2.5 showing at least the architecture and overall span of the network across Locations. [PSR: Conceptual network drawings]
- 4.11 All CN Equipment, including cables, fiber, junction boxes, patch panels, and other CN components, shall have clear identifying labels that match identifying information on the drawings.

- 4.12 The SI shall ensure that all Devices and equipment that connect to a Cellular Technology Common Carrier Network and make up or comprise any portion of the CN are certified to specific Long Term Evolution (LTE) bands (“LTE Certification”) in accordance with the following:
- 4.12.1 The SI shall achieve certification to LTE bands 2, 4, and 13 prior to the Installation Commencement Date.
 - 4.12.2 The SI shall perform testing to establish LTE Certification. Such testing must account for locations of Devices as required in the Contract Standards and proposed by the SI (for example, in-building and on-Vehicle).
 - 4.12.3 The SI shall ensure that LTE Certification is current and valid at the time each Device or item of CN Equipment is installed.
 - 4.12.4 Copies of certification records relating to each LTE Certification shall be provided to the MBTA prior to the Installation Commencement Date and upon request any time during the Term. [CDRL: LTE Certification records]
 - 4.12.5 The SI shall sustain LTE Certification throughout the Term for all CN Equipment and Devices that contain CN Equipment through renewal, recertification, or replacement of components or subcomponents.
 - 4.12.6 The SI shall ensure that all CN Equipment and Devices that contain CN Equipment that connect to a Cellular Technology Common Carrier Network and make up or comprise any portion of the CN are certified to LTE band 5 by no later than one (1) year following the MBTA’s written request at any time during the Term at no additional cost.
- 4.13 References to other requirements
- 4.13.1 All CN Equipment and connections must be included and tracked in the Automated Monitoring Subsystem (described in Appendix 4.6), monitoring all metrics that the device exposes and the SI must regularly refine alerting thresholds for each metric to avoid false alarms.
 - 4.13.1.1 The Proposal shall include lists of what specifically will and will not be monitored for each type of device. [PSR: Monitoring of CN equipment]
 - 4.13.2 CN Equipment and connections are in scope of all Handback Requirements.
 - 4.13.3 Access Procedures: SI shall comply with MBTA facility security policies, including Attachment 2 (MBTA Special Order 15-034) and any later reissuance thereof or a superseding policy. For purposes of this Section 4.13.3, without limiting anything under Section 25.1 of the Project Agreement, the SI and its Personnel shall be subject to all restrictions applicable to any “employee” (or equivalent term) as used in such policies.
 - 4.13.4 The CN must be made available in accordance with all other applicable Contract Standards, including those in Appendix 2.11 and Appendix 3.1.
- 4.14 All CN Equipment shall be suitable for the environment in which it is placed. The SI acknowledges that environmental conditions of Locations and Vehicles vary, that most do not have temperature control or air filtering, and that it is the SI’s responsibility to assess the conditions in each Location and Vehicle and account for risks relating to environmental conditions across all seasons in selecting the particular CN Equipment. In addition to temperature, other environmental issues which must be taken into account by the SI include rail dust and salt air at some Stations. Failure of CN Equipment due to environmental conditions shall not be a Supervening Event except as specifically defined in this Project Agreement. At a minimum, all CN Equipment shall be capable of:
- 4.14.1 Passing a contamination by fluids test defined in MIL-STD-810G (w/CHANGE-1):2014 – Environmental Engineering Considerations and Laboratory Tests, and
 - 4.14.2 Operating between an ambient range of -25 to +55 degrees Celsius, and
 - 4.14.3 Operating after being stored at temperatures between -30 to +70 degrees Celsius, and

- 4.14.4 Operating when exposed to a relative humidity of 95% without condensation at 35 degrees Celsius, and
- 4.14.5 Demonstrating that the CN Equipment or its enclosure has an IP rating as per IEC-60529 Ed. 2.2 b:2013 that is suitable to its role and location.

5. Use of MBTA Layer 2 Services

- 5.1 For the Stations, garages, and carhouses listed in Attachment 1 (List of Locations with existing MBTA Layer 2 Services available), the SI may use MBTA Layer 2 Services, where “Layer 2 Services” refers to the widely accepted technology industry meaning of the phrase and includes, for example, the physical links needed for Data transport from the MBTA Demarcation Point defined below and the MBTA Data Center Demarcation Points defined below, but does not include, for example, switching, addressing, nor route definition and selection to one or both MBTA Data Center Demarcation Points.
- 5.2 If the SI elects to utilize the MBTA Layer 2 Services, the SI shall pay the MBTA, by wire transfer or ACH, the MBTA Layer 2 Services Fixed Amount per month (Index Linked and subject to adjustment pursuant to Section 5.5 below of this Appendix 2.5) plus the MBTA Layer 2 Services Variable Amount per month per Station, garage, or carhouse (Index Linked) for the use of the MBTA Layer 2 Services commencing with the month in which the SI first uses such services and for each month thereafter that the SI continues to use such services; provided that, commencing with the first Monthly Invoice following the Revenue Service Commencement Date, the SI shall instead deduct the total monthly amount due in accordance with this Section 5.2 from each Monthly Invoice in accordance with Appendix 8 (Payment Mechanism) and Article 10 (Payments) of the Project Agreement. The SI shall report the total number of stations, garages or carhouses utilizing the MBTA Layer 2 Services in the Month as the Total MBTA Layer 2 Service Locations.
- 5.3 The MBTA will make available MBTA Layer 2 Services at any Station, garage, or carhouse listed in Attachment 1 (List of Locations with existing MBTA Layer 2 Services available) which the SI elects to use by providing one Ethernet port at each Station, garage, or carhouse. This connection point shall be the “MBTA Demarcation Point.”
- 5.4 The Proposal shall identify the extent to which the SI will use MBTA Layer 2 Services. [PSR: Use of MBTA Layer 2 Services]
- 5.5 Moderating use of this shared service:
 - 5.5.1 The CN must prevent multicast traffic (as defined in Internet Engineering Task Force RFC 1112 and as generally understood in technology industry usage) from passing from a Station, garage, or carhouse out to or through the MBTA Demarcation Point.
 - 5.5.2 The Proposal shall include estimated network traffic on a Monthly basis that will flow into and out of the MBTA Demarcation Point for each Station, garage, or carhouse at which the SI chooses to use the MBTA Layer 2 Services. [PSR: Use of MBTA Layer 2 Services]
 - 5.5.3 The network traffic may exceed the SI’s estimate by up to 150% over any month throughout the Term with no additional charge. Any traffic more than 150% of the estimate in any Month will result in an additional charge (part of the MBTA Layer 2 Services Excess Amount) of 50% of the per-Station, garage, or carhouse fee noted above for each Month in which the overage condition exists.
 - 5.5.4 In addition to the monthly traffic requirement, the SI shall limit peak bandwidth consumption at each Station, garage, or carhouse to no more than twenty (20) megabits per second (mbps) at all times. In any Month when the SI exceeds this peak bandwidth rate for a sustained period of more than five (5) minutes in the aggregate for any Station, garage, or

- carhouse, in an additional charge (part of the MBTA Layer 2 Services Excess Amount) of 50% of the per-Station, garage, or carhouse fee noted above will be applied.
- 5.5.5 The SI shall not interfere with or modify any components in any communications room or other shared space in which CN Equipment is placed other than SI-provided devices up to the MBTA Demarcation point.
- 5.6 Connecting MBTA Layer 2 Services to the rest of the CN
- 5.6.1 The MBTA will make available one Ethernet at each of its two primary MBTA Data Centers (currently at 45 High Street and 10 Park Plaza in Boston) where the SI shall connect the rest of the CN to the MBTA Layer 2 Services.
- 5.6.2 The SI may place CN Equipment at each MBTA Data Center; the MBTA will be responsible for providing physical space, power, cooling, and facility access, subject to SI compliance with all applicable access requirements.
- 5.6.3 The Proposal shall identify the SI's requirements for equipment rack space and power. [PSR: Use of MBTA Layer 2 Services]
- 5.6.4 SI shall provide all of its own rack equipment in space identified in the Data Centers by the MBTA and may not place more than one 42U-sized rack.
- 5.6.5 The CN may terminate leased lines or other carrier connections at each MBTA Data Center.
- 5.6.6 The CN may not use an MBTA Internet connection at either MBTA Data Center.
- 5.6.7 The CN shall include in-building cabling at each MBTA Data Center required for these connections; the approach and implementation plan for this work must be provided in advance and the SI must have prior written MBTA approval of the plan.
- 5.7 Performance and Availability Characteristics of MBTA Layer 2 Services:
- 5.7.1 The MBTA Layer 2 services provide ≤ 10 millisecond delivery each way between the MBTA Demarcation Point and the MBTA Data Center Demarcation Points. The failure of the MBTA Layer 2 Services to meet this performance characteristic will constitute a Relief Event, subject to Article 13 of the Project Agreement.
- 5.7.2 The MBTA Layer 2 Services will be 99.5% available across all Stations per month, calculated based on total potential hours of availability per month using hours of MBTA revenue service, excluding periods of scheduled maintenance (as defined immediately below). The failure of the MBTA Layer 2 Services to meet this availability characteristic will constitute a Relief Event, subject to Article 13 of the Project Agreement.
- 5.7.3 Scheduled maintenance on the MBTA Layer 2 Services is excluded for purposes of calculating the availability of the MBTA Layer 2 Services. Scheduled maintenance on the MBTA Layer 2 Services is that maintenance which:
- 5.7.3.1 Is scheduled by the MBTA and with notice to the SI at least two (2) weeks in advance, and
- 5.7.3.2 Does not occur during a Special Event, and
- 5.7.3.3 Does not cover more than 1.0% of the Total Potential Hours of Availability per Month for all MBTA Layer 2 Services.

6. Stations and In-Station Devices

- 6.1.1 The SI shall specify all CN installation work that is in the scope of the DB Installation Work (as defined in this Project Agreement) as described in Appendix 2.13.
- 6.1.2 All CN installation work that is not in the scope of the DB Installation Work shall be performed by the SI and may not be proposed for inclusion in the DB Contract.

- 6.1.3 Use of existing fiber:
 - 6.1.3.1 The CN may use any existing unused spare fiber running from station communication rooms to intermediary staging locations (including locations labeled as “booths” on the as-built drawings) and to AFC 1.0 devices.
 - 6.1.3.2 The MBTA makes no representations concerning the existence or usefulness of any spare fiber.
 - 6.1.3.3 The SI shall advise MBTA what spare fiber is to be used as part of the CN.
[CDRL: Spare fiber to be used as part of CN]
 - 6.1.3.4 The CN may not use any existing MBTA fiber switches; any fiber switches necessary for the System to work properly shall be provided by the SI as part of the CN.
- 6.1.4 The SI shall ensure the work done to install and maintain the CN does not impact any other MBTA systems and services in any shared facilities (communication rooms, booths, etc.).

7. Non-Production Communications Network

- 7.1 The SI shall provide networks of equivalent functionality and behavior as the Communication Network, set forth above, to support the Model Office described in Appendix 2.4.
- 7.2 No data may flow between the non-production Communications Network and the CN.

8. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.5. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 3.1, 3.1B, 3.7, 3.8, and 3.10. [PSR: Proposer team experience: System capabilities and information security]

APPENDIX 2.6

CLOSED-LOOP FARE MEDIA

The System shall produce, recognize and make available the Fare Card, a closed-loop payment Credential accepted only on the System serving as an identifier associated with a User's Account. The SI shall select the Fare Card Credential and the Media on which it resides in accordance with Good Industry Practice for payments in the transit industry, and meeting international open standards.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.6 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Closed-loop Fare Media general approach]

1. Fare Card Media

The SI's Proposal shall include a description of the selected Fare Card Media and, if Temporary Fare Card Media is proposed, it shall describe any differences between the Standard Fare Card Media and the Temporary Fare Card Media. [PSR: Proposed Fare Card Media]

- 1.1 The Fare Card shall be available to Users using up to two (2) different Media: one for Standard Fare Cards and optionally another for Temporary Fare Cards. If all Fare Vending Machine Variants are capable of issuing Standard Fare Cards, there is no requirement for Temporary Fare Cards. Unless identified specifically, all requirements in this Appendix 2.6 apply to both Standard Fare Cards and Temporary Fare Cards.
- 1.2 The SI shall select the ISO/IEC 14443 compliant contactless card Media to be used for the Standard Fare Card which shall be compliant with at least the following specifications:
 - 1.2.1 International Standards Organization (ISO)
 - 1.2.1.1 ISO 7810:2003 "Identification Cards - Physical Characteristics"
 - 1.2.1.2 ISO 14443: "Identification Cards - Contactless Integrated Circuit(s) Cards - Proximity Cards"
 - 1.2.1.3 ISO 10373: "Identification Cards - Test Methods"
 - 1.2.2 International Electrotechnical Commission (IEC)
 - 1.2.2.1 IEC 61000-4-2: "Electromagnetic Compatibility (EMC) - Part 4: Testing and Measurement Techniques - Electrostatic Discharge Immunity Test"
 - 1.2.3 National Committee for Information Technology Standards (NCITS)
 - 1.2.3.1 NCITS 322-2002: "American National Standard for Information Technology - Card Durability Test Methods"
- 1.3 The Standard Fare Card issued on plastic card media must be available as an ISO/IEC 7810 ID-1 format card.
- 1.4 The Temporary Fare Card shall be issued on a suitable ISO/IEC 14443 media.
- 1.5 The Fare Card shall not use optical technologies.
- 1.6 The Fare Card shall comply with all requirements of Appendix 4.4 that relate to Fare Cards.

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- 1.7 The SI shall provide Enhanced Fare Cards.
 - 1.7.1 Enhanced Fare Cards are intended to support additional functionality that will enable the MBTA to load applications onto the card for other purposes.
 - 1.7.2 The Enhanced Fare Cards provided for such uses must include the capability and rights for the MBTA to read the permanent smartcard chip unique identifier (UID) for use in the MBTA's access control system.
 - 1.7.2.1 The smartcard chip used to enable this capability need not necessarily be the same as the SI chooses for the Standard Fare Card in Section 3 of this Appendix 2.6.
 - 1.7.2.2 The smartcard chip the SI uses to enable this capability shall support one of the following technologies: Weigand Prox, iClass, iClass Seos, MiFARE Classic, MiFARE DESFire, HID Prox, Indala Prox, EM4102 Prox, or PIV. A MiFARE or HID-based chip is preferred.
 - 1.7.2.2.1 The SI's Proposal shall identify the smartcard chip type for MBTA employee access control. [PSR: Proposed Fare Card Media]
 - 1.8 In no case may the worst case useful life of the Media be less than five (5) years for the Standard Fare Card. The Temporary Fare Card useful life shall be greater than one (1) year.
 - 1.8.1 Media which fails prior to the cited worst-case useful life will be considered not available for purposes of evaluating the Key Performance Indicators.
 - 1.8.2 The SI's Proposal shall identify the best case and worst case useful life of the Media that is proposed by the SI for use in the System. If more than one type of Media is proposed, useful life must be identified for each such type. [PSR: Proposed Fare Card Media]
 - 1.9 The SI shall implement a method to produce sponsored and promotional versions of the Fare Card with different artwork identified by MBTA from time to time. This requirement does not apply to the Fare Cards distributed for use at Retail Reload Locations.
 - 1.9.1 The SI's Proposal shall describe the method for producing promotional versions of Fare Cards, including process, timeframes, quantity and frequency limits. [PSR: Proposed Fare Card Media]
 - 1.10 The Fare Card shall be reloadable via Retail Reload Locations, on the System Website, through the Customer Support Software, at all Fare Vending Machines, and via the Application Programming Interfaces (APIs).
 - 1.10.1 The Fare Card shall be reloadable with cash at all Sales Channels except the System Website and Customer Support Software.
 - 1.10.2 Fare Cards shall be reloadable with any Payment Card (including non-contactless Payment Cards), at all Sales Channels, except as further clarified in Appendix 2.15.
 - 1.10.3 The Fare Card shall be reloadable using the ACH and invoicing methods described in Appendix 3.8 for Group accounts.
 - 1.11 The System shall support Users in transferring their Account Balance from a Temporary Fare Card to a Standard Fare Card or the Mobile Fare Card by reassigning the primary Credential for the Account. The Temporary Fare Card shall remain Active until the new Media is available to the User for use and made not Active upon use of the new Media. This functionality shall be available through the following Sales Channels, at a Configurable Enablement Fee per channel (initially set to \$0):
 - 1.11.1 System Website,
 - 1.11.2 Customer Support Software, and
 - 1.11.3 any FVM that issues Standard Fare Cards and has them in stock.

- 1.12 The MBTA shall have rights to read any unencrypted Credential serial number from any Fare Card and use that serial number for any purpose.

2. Fare Card Media Selection, Environmental Limits, and Compromise

- 2.1 The SI is responsible for the selection of the best possible card medium and chip for the Fare Card. Should any feature of the selected card medium be compromised, physically or cryptographically during the Term, the SI shall, at its own expense, replace all the issued Fare Cards with an upgraded version or alternative and comply with all other Contract Standards regarding data breaches. [CDRL: Updated Fare Card Media specifications]
 - 2.1.1 The Fare Card is considered compromised for purposes of this requirement if any exploit has been demonstrated to the SI or the MBTA that clones a Fare Card or modifies the Data on a Fare Card. Once a compromise has occurred, the SI has fifteen (15) Business Days to provide a risk analysis and Remediation Plan. [CDRL: Fare Card compromise risk analysis and Remediation Plan]
 - 2.1.2 Once an exploit has been used in the System to access Transportation Services or Integrated Services, the SI has ten (10) Business Days to identify System modifications to eliminate further risk of the exploit being used in the System, and another fifteen (15) Business Days after MBTA review of the modifications to implement the System modifications. [CDRL: Fare Card exploit remediation System modifications]
 - 2.1.3 If an exploit is used in the System again after the System modification implementation period described in Section 2.1.2 above to a degree that fifty thousand dollars (\$50,000) worth of Products or Fares are provided without legitimate payment by a Customer, an Incident has occurred, and without limiting any requirement hereunder in respect of Incidents, including as set forth in Appendix 3.1, the SI shall mobilize a campaign to replace all issued Fare Cards, inclusive of all outreach, direct customer service, fulfillment and distribution, field work, exception handling, data cleansing and reconciliation, and continuous improvement of the process based on customer feedback, to replace ninety percent (90%) of Fare Cards in active use (defined for this purpose as those used in the year prior to the triggering exploit) within ninety (90) days of the triggering exploit.
 - 2.1.4 The System must stop accepting all potentially compromised Fare Cards once the replacement campaign period described above is complete, or at a later date, at the discretion of the MBTA. The System must still enable Users to access and manage Accounts that were previously associated with the Fare Cards no longer accepted by the System.
- 2.2 The System must enable any transition or upgrade to a new card medium for Fare Cards with the need for no hardware changes to Readers.
- 2.3 The selected Standard Fare Card medium shall satisfy all tolerance requirements defined in section 8 of ISO/IEC 7810:2003 – “Card Characteristics” and the most recently published version of Parts 1 and 6 of ISO/IEC 10373: “Identification cards – Test methods”.
- 2.4 The selected Standard Fare Card Media shall satisfy all tolerance requirements defined in the MasterCard Card Quality Management (CQM) standard for Bending Stiffness (TM-408).
- 2.5 Proposed Fare Card Media shall be agreed with the MBTA.

3. Fare Card Credential

The SI's Proposal shall include a description of the selected Fare Card Credential. [PSR: Fare Card Credential conceptual design]

- 3.1 The specifics of the digital architecture for the design of the Fare Card Credential shall be defined by the SI.
 - 3.1.1 The SI's Proposal shall describe the digital architecture for the Fare Card Credential. [PSR: Proposed Fare Card Credential conceptual design]
 - 3.1.2 The SI shall update the digital architecture for the Fare Card Credential whenever it changes. [CDRL: Updated digital architecture for Fare Card Credential]
 - 3.1.3 The design of the Fare Card Credential shall be subject to Design Review as described in Appendix 7. [CDRL: Fare Card Credential preliminary design] [CDRL: Fare Card Credential final design]
- 3.2 The data required for the card application shall be determined by the SI.
- 3.3 If the SI places Data on the Fare Card, it must define and describe its use and keep that document up to date at all times. An example is the date/time and location of the last Tap. [CDRL: Updated Data stored locally on the Fare Card]
 - 3.3.1 The SI's Proposal shall define and describe Data stored locally on the Fare Card. [PSR: Fare Card Credential conceptual design]
- 3.4 The Credential shall not contain any PII (that Data described in Appendix 3.1A) other than the Credential identifier. Some Media (Employee IDs on Enhanced Fare Cards or Custom Fare Cards, for example) are allowed as an exception to contain printed-on PII.
- 3.5 The digital architecture for the reloadable Standard Fare Cards may differ from the digital architecture of Temporary Fare Cards.
 - 3.5.1 The SI's Proposal shall identify any such differences in the digital architecture for the Temporary Fare Card Credential. [PSR: Fare Card Credential conceptual design]
 - 3.5.2 The SI shall update the digital architecture for Temporary Fare Cards whenever it changes. [CDRL: Updated digital architecture for Temporary Fare Card Credential]
- 3.6 The Fare Card Credential may not locally store or house any Data pertaining to a User's Account Balance, Pass Product entitlement or Reduced Fare eligibility.
- 3.7 The Credential shall provide information to a Reader to establish with certainty that it is a Fare Card.
- 3.8 The System shall not permit any Fare Card to be used to access Transportation Services nor Integrated Services unless it is Enabled, by way of payment or waiver of Enablement Fee as defined by MBTA Fare Policy and Configuration. The process to Enable a Fare Card shall not rely on any Data stored locally on the Credential.
- 3.9 Neither the System nor the SI shall cause nor allow any Fare Card Credential to expire (that is, stop being recognized and accepted by the System) for any reason other than one specifically called out in the Technical Requirements. For example, the System may not proactively expire or stop recognizing a Fare Card prior to reaching its anticipated lifespan.
- 3.10 The System shall ensure that Fare Cards may not be used beyond their expiration date or beyond the Velocity limits defined by Fare Policy in Appendix 3.7 and System Configuration.

- 3.11 The System shall not permit any Fare Card to be used to access Transportation Services nor Integrated Services unless it is Activated by the SI. The System shall have Configurable ability to have a Fare Card be Enabled but not accepted for use within the System until the User who ordered the Fare Card acknowledges receipt of the Fare Card and requests that the card be Activated. The process to Activate a Fare Card shall not solely rely on any Data stored locally on the Credential.

4. Fare Card Credential and NFC Devices

- 4.1 The Fare Card Credential shall support a Contactless EMV Credential capable of operating on both contactless Payment Cards and NFC Devices.
- 4.1.1 The SI must explain in its Proposal how this will be accomplished. [PSR: NFC Devices proposal]
- 4.2 If the chip technology on which the Fare Card Credential is based cannot be licensed for use as a mobile Credential, the SI must provide an alternative Credential that can be implemented on NFC Devices.
- 4.2.1 The SI's Proposal shall describe the alternative Credential for NFC Devices. [PSR: NFC Devices proposal]
- 4.3 The Fare Card Credential shall be capable of being transferred from physical Fare Card Media to an NFC Device.
- 4.3.1 The SI's Proposal shall identify how the transfer of a Credential from a physical Fare Card Media to an NFC Device will be accomplished and any limitations this places on the User (for example, what mobile device types can be used). [PSR: NFC Devices proposal]
- 4.4 A Fare Card-equivalent Credential must be able to be instantiated in the NFC Device without the need for a physical Fare Card. The MBTA shall be able to Configure an Enablement Fee charged to Enable the Fare Card-equivalent Credential, or to Configure it not to charge any Enablement Fee.

5. Mobile Fare Card

The SI shall develop and provide a method to allow Users to use a Mobile Fare Card in a Tap.

- 5.1 Proposal and design development. The Mobile Fare Card shall be subject to Design Review as described in Appendix 7.
- 5.1.1 The SI's Proposal shall include a conceptual design for the Mobile Fare Card which describes its approach to meeting the requirements for the Mobile Fare Card and specifies whether the functionality will be supported for each platform via native wallet or app functionality. The Proposal shall include a description of the Mobile Fare Card, a preliminary concept and, if available, an example of a mobile fare card developed for another transit agency using a similar approach. [PSR: Mobile Fare Card conceptual design]
- 5.1.2 The Preliminary Design Review shall include:
- 5.1.2.1 Updates to the Mobile Fare Card proposal described in Section 5.1.1 based on further development of the concept and feedback from the Conceptual Design Review.
- 5.1.2.2 The OS support matrix described in Section 5.6.1 of this Appendix 2.6.
- 5.1.2.3 If developing a mobile application, a style guide and wireframes as described in Section 5.10 of this Appendix 2.6.
[CDRL: Mobile Fare Card preliminary design]

- 5.1.3 For Final Design Review, the SI shall provide a prototype or beta version of the Mobile Fare Card. [CDRL: Mobile Fare Card final design]
- 5.2 NFC. The Mobile Fare Card may use only near field communications (NFC) technology to interact with Readers. The SI may not use barcode or other optical technology to interact with Readers.
- 5.3 Reload. The Mobile Fare Card shall enable Account reloading at all Sales Channels as required for the Standard Fare Card.
 - 5.3.1 The SI shall propose a method to enable the presentation of the Mobile Fare Card at Retail Reload Locations. A barcode or other optical method is permitted for this purpose, provided that it is not used to interact with Readers (as described in Section 5.2 above).
 - 5.3.2 The SI's Proposal shall explain its approach to supporting Mobile Fare Card reload at all Sales Channels. [PSR: Mobile Fare Card conceptual design]
- 5.4 Group and Reduced Fare Group enrollment. The Mobile Fare Card shall be able to be added to a Group or Reduced Fare Group.
 - 5.4.1 The SI's Proposal shall describe an approach for Mobile Fare Card Group and Reduced Fare Group enrollment. [PSR: Mobile Fare Card conceptual design]
- 5.5 Data. The Mobile Fare Card shall not cause any Data pertaining to a User's Account or Pass entitlement to be stored or housed on the mobile device. The Mobile Fare Card shall act as an identifier associated with the User's Account, within the limits defined in Appendix 3.1A.
- 5.6 Platforms. The Mobile Fare Card shall be available on iPhone and Android and shall be supported on the latest operating systems (OS) for each at all times throughout the Term.
 - 5.6.1 The SI shall provide an OS support matrix which describes the levels of support for the Mobile Fare Card on each OS version during the Mobile Fare Card Preliminary Design Review and update it throughout the Term whenever it changes. [CDRL: OS support matrix for Mobile Fare Card] [CDRL: Updated OS support matrix for Mobile Fare Card]
 - 5.6.2 The SI's Proposal shall describe its approach to new releases for updates to operating systems and reported bugs. [PSR: Mobile Fare Card conceptual design]
- 5.7 Cash. The Mobile Fare Card shall support Users who do not have Payment Cards in adding value to their Accounts with cash.
 - 5.7.1 The SI's Proposal shall describe how this adding value to Fare Card Mobile Application with cash will be supported. [PSR: Mobile Fare Card conceptual design]
- 5.8 Testing. The SI shall complete testing on each release of the Mobile Fare Card as described in Appendix 2.16 and Appendix 4.3. The SI shall support a method of distribution to provide a pre-release version of the Mobile Fare Card for testing and Pilots. The Model Office proposed configuration mode (described in Appendix 2.4) shall also include any such pre-release versions.
- 5.9 Security. The Mobile Fare Card shall implement equivalent security as used by the payments industry and shall meet the requirements for Mutual Authentication described in Appendix 3.2.
- 5.10 Each platform and operating system which the Mobile Fare Card is required hereunder to support must have a functional implementation of the Mobile Fare Card. The Mobile Fare Card may be implemented by the SI using either native wallet functionality or the Fare Card Mobile Application.

The approach may differ for each platform. The SI shall account for cost optimization and User experience in its choices.

- 5.10.1 If native wallet functionality is used to fulfill the requirements of Section 5.10 of this Appendix 2.6, the SI shall provide all ancillary support and is responsible for all costs, including provisioning, generating any virtual card numbers, and paying fees to wallet providers. If a mobile application approach is used to fulfill the requirements of Section 5.10 of this Appendix 2.6, the SI shall comply with all requirements of Section 5.10.3 of this Appendix 2.6.
- 5.10.2 If the operating system of any mobile device platform which the Mobile Fare Card is required hereunder to support does not allow access to NFC technology (but the platform has NFC technology support) as of the Installation Commencement Date, then the SI shall implement the Mobile Fare Card for that platform using existing usable provisioning rails with an issued branded Payment Card and linking this to the User's Account and the virtual Payment Card account through a back office process.
 - 5.10.2.1 If a mobile device operating system or platform meeting the criteria in Section 5.10.2 of this Appendix 2.6 enables access to the NFC technology after the Installation Commencement Date, the SI shall Upgrade the Fare Card Mobile Application if doing so is reasonably expected to result in savings in components of Allowable AP Transaction Fees greater than \$300,000 annually (Index Linked), and the SI may choose to migrate to the native wallet functionality even if that threshold is not reached.
 - 5.10.2.2 In the event the SI chooses to migrate from the Fare Card Mobile Application to a native wallet approach in respect of any mobile device platform, the SI shall allow Users a transition period of at least six (6) months before discontinuing support of the relevant functionality in the Fare Card Mobile Application.
- 5.10.3 If a mobile application is developed to satisfy requirements of Section 5.10 of this Appendix 2.6, it shall meet the requirements of this Section 5.10.3 and all other requirements of the Fare Card Mobile Application.
 - 5.10.3.1 Payments. The Fare Card Mobile Application shall handle payments as defined in Appendix 3.6 and shall maximize the opportunity for Users to use mobile wallet 'in-app' payment technologies to take advantage of card-present interchange rates.
 - 5.10.3.1.1 The SI's Proposal shall describe which 'in app' payment technologies will be used and how. [PSR: Mobile Fare Card conceptual design]
 - 5.10.3.2 Style and brand. The visual design of the Fare Card Mobile Application shall align with the MBTA Tech Style Guide and the AFC 2.0 Brand Style & Use Guide. The MBTA Tech Style Guide is a living document published at https://beta.mbta.com/style_guide (when the beta site goes live this URL will change to www.mbta.com/style_guide).
 - 5.10.3.2.1 The SI shall provide a style guide for the Fare Card Mobile Application during Preliminary Design Review. The Fare Card Mobile Application style guide shall include descriptions of the styles proposed for use, including fonts, logo, colors, sample language and iconography. It shall also include an explanation of how the styles align with the MBTA Tech Style Guide and the AFC 2.0 Brand Style & Use Guide and examples of the styles shown on the latest Apple and Android devices through screenshots and mockups. [CDRL: Fare Card Mobile Application style guide]
 - 5.10.3.3 App stores. The Fare Card Mobile Application shall be made available to the public through MBTA-managed app store accounts for Apple and Google.

- 5.10.3.3.1 The Fare Card Mobile Application shall meet Apple App Store and Google Play requirements for mobile apps. The SI shall resolve any issues in order to gain app store approval.
- 5.10.3.3.2 The MBTA will advise the SI of one of the following two dispositions prior to the submission of the app to the app stores, and the SI shall take all steps needed to bring about the disposition: either (a) directly handle app store submission and approval or (b) provide the required files and information and support the MBTA in handling the submission and approval process.
- 5.10.3.3.3 The Project Schedule shall account for app store approval times.
- 5.10.3.3.4 The SI shall resolve issues or bugs reported via app store reviews and recorded in developer reports.
- 5.10.3.3.5 The Fare Card Mobile Application shall be available exclusively for Pilot participants during the Pilots and shall be available to the general public by the Revenue Service Commencement Date.
- 5.10.3.3.6 The SI's Proposal shall describe its approach to distributing pre-release versions of the app for testing and Pilots and to monitoring and addressing bugs and crashes. [PSR: Mobile Fare Card conceptual design]
- 5.10.3.4 Accessibility. The Fare Card Mobile Application shall:
 - 5.10.3.4.1 Comply with Applicable Accessibility Law.
 - 5.10.3.4.2 Be included in the Digital Accessibility Audit, further described in Appendix 2.9.
 - 5.10.3.4.3 Utilize platform-specific accessibility services as described in iOS Developer Accessibility Programming Guide (<https://developer.apple.com/accessibility/ios/>) and Android Developer Accessibility (<https://developer.android.com/guide/topics/ui/accessibility>).
- 5.10.3.5 User Interface. The Mobile Fare Card Mobile Application shall be easy to use, facilitate transit system throughput, and minimize queuing. It shall be designed and developed in a manner consistent with mobile app industry best practices for user experience, interaction design, and mobile payments.
 - 5.10.3.5.1 During Preliminary Design Review, the SI shall provide annotated wireframes that describe the functionality to be developed and reflect and usability considerations. [CDRL: Fare Card Mobile Application wireframes]
- 5.10.3.6 Authentication and Account Management. The Fare Card Mobile Application shall provide seamless access to Account management functionality described in Appendix 3.8.
 - 5.10.3.6.1 The Fare Card Mobile Application shall utilize the same login/password information as the System Website.
 - 5.10.3.6.2 User Account information and settings shall be synchronized between the System Website and Mobile Application, as applicable.
 - 5.10.3.6.3 The Fare Card Mobile Application shall support an option for the User to utilize an authentication method (e.g. PIN or fingerprint) required each time the application is opened. The authentication method shall be stored securely and shall not impact throughput.
 - 5.10.3.6.4 The SI's Proposal shall explain its approach to optional User authentication. [PSR: Mobile Fare Card conceptual design]

- 5.10.3.6.5 The SI's Proposal shall explain how the Fare Card Mobile Application will provide access to Account management functionality, including how this approach helps facilitate transit system throughput and minimize queueing. [PSR: Mobile Fare Card conceptual design]
- 5.10.3.7 Purchases. The Fare Card Mobile Application shall provide seamless access to purchase Products and add value via a mobile device.
 - 5.10.3.7.1 The Fare Card Mobile Application shall support Users who prefer to make in-person purchases at Fare Vending Machines or Retail Reload Locations by providing information about nearby POS Locations.
 - 5.10.3.7.2 The SI's Proposal shall describe how the Fare Card Mobile Application will provide access to Sales Channels. [PSR: Mobile Fare Card conceptual design]
- 5.10.3.8 Customer Support. The Fare Card Mobile Application shall provide an obvious way for Users to report technical problems through the standard MBTA customer contact form.
 - 5.10.3.8.1 The SI's Proposal shall describe how the Fare Card Mobile Application will provide access to the contact form. [PSR: Mobile Fare Card conceptual design]
- 5.10.3.9 Trip planning. The Fare Card Mobile Application shall provide seamless access to trip planning tools (http://www.mbtta.com/rider_tools/trip_planner/) and service alerts (http://www.mbtta.com/rider_tools/transit_updates/) on MBTA.com. The MBTA expects the newly redesigned MBTA.com to be released during the procurement process, which will include mobile-optimized versions of these pages and may result in a change in the URLs.
 - 5.10.3.9.1 The SI's Proposal shall describe how the Fare Card Mobile Application will provide access to trip planning tools and service alerts. [PSR: Mobile Fare Card conceptual design]
- 5.10.3.10 Offline functionality. The Fare Card Mobile Application shall provide limited functionality in areas without cellular service, or where internet service is intermittent. A clear message will indicate that limited functionality is available due to no internet connection.
 - 5.10.3.10.1 The SI's Proposal shall include a description of offline functionality. [PSR: Mobile Fare Card conceptual design]
- 5.10.3.11 Source Code and Documentation. Prior to Installation, upon request and at Handback, the SI shall produce to the MBTA all Source Code, Documentation, and other necessary intellectual property and information. [CDRL: Fare Card Mobile Application Source Code and Documentation]
- 5.10.3.12 Security Exploit. Should any feature of the Fare Card Mobile Application be compromised during the Term, the SI shall, at its own expense, automatically replace all the issued Mobile Fare Cards and Mobile Fare Card Applications with an upgraded version or alternative and comply with all other Contract Standards regarding data breaches. [CDRL: Updated Mobile Fare Card specifications]
 - 5.10.3.12.1 The Fare Card Mobile Application is considered compromised for purposes of this requirement if any exploit has been demonstrated to the SI or the MBTA that clones a Mobile Fare Card or modifies the Data on a Mobile Fare Card. Once a compromise has occurred, the SI has fifteen (15) Business Days to provide a risk analysis and remediation plan. [CDRL: Mobile Fare Card compromise risk analysis and remediation plan]

- 5.10.3.12.2 Once an exploit has been used in the System to access Transportation Services or Integrated Services, the SI has ten (10) Business Days to identify System modifications to eliminate further risk of the exploit being used in the System, and another fifteen (15) Business Days after MBTA review of the modifications to implement the System modifications. [CDRL: Mobile Fare Card exploit remediation System modifications]
- 5.10.3.12.3 If an exploit is used in the System again after the System modification implementation period described in Section 5.10.3.12.2 above to a degree that fifty thousand dollars (\$50,000) worth of Products or Fares are provided without legitimate payment by a Customer, the SI shall mobilize a campaign to digitally re-issue all Mobile Fare Cards, inclusive of all outreach, direct customer service, User support, field work, exception handling, data cleansing and reconciliation, and continuous improvement of the process based on customer feedback, to replace ninety percent (90%) of Mobile Fare Cards in active use (defined for this purpose as those used in the year prior to the triggering exploit) within ninety (90) days of the triggering exploit.
- 5.10.3.12.4 The System must stop accepting all potentially compromised Mobile Fare Cards once the replacement campaign period described above is complete, or at a later date, at the discretion of the MBTA. The System must still enable Users to access and manage Accounts that were previously associated with the Mobile Fare Cards no longer accepted by the System.

6. Custom Fare Cards

The Fare Card Media and Credential shall be customizable to permit third parties, including universities and employers, to embed the Fare Card Credential into their own building access or ID cards, as further defined in Appendix 4.4.

7. Security

- 7.1 The Fare Card Media and Credential must meet all requirements of Appendix 3.1 and Good Industry Practice for closed loop transportation media and smartcard security standards employing techniques such as:
- 7.1.1 3DES;
 - 7.1.2 AES;
 - 7.1.3 True Random Number Generation; and
 - 7.1.4 Standard Fare Card Media shall additionally meet Common Criteria EAL 4+.
- 7.2 The Fare Card Media and Credential shall not use proprietary cryptographic algorithms or communication protocols.

8. Intellectual Property

The MBTA shall have Intellectual Property rights to the card application, layout, reader logic and keys used for the Fare Card. However, the SI shall have supervision and complete accountability for card logic and keys, and must hold the keys securely until Termination. The SI must provide MBTA at Handback with sufficient Documentation, supporting information and tools to allow the MBTA to encode and

manufacture the Fare Card. [CDRL: Documentation, supporting information and tools for card logic and keys]

9. Availability Payments

For purposes of determining how many Fare Cards are eligible for the SI to invoice MBTA as part of Availability Payments,

- 9.1 Subject to Section 9.2 of this Appendix 2.6, only Fare Cards which meet one of the following are eligible:
 - 9.1.1 Fare Cards which have been Enabled by way of a User paying the Enablement Fee Configured by MBTA,
 - 9.1.2 Fare Cards which have been Enabled by way of MBTA waiving the Enablement Fee, and
 - 9.1.3 Fare Cards which have been Enabled by way of MBTA Fare Policy and Configuration allowing the transfer of an Enabled status from one Fare Card to another.
- 9.2 Fare Cards which meet one of the criteria in Section 9.1 of this Appendix 2.6, but are nonetheless ineligible:
 - 9.2.1 Custom Fare Cards which have been Enabled by way of a special order for customized Media by a third party as defined in Appendix 4.4.

10. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.6. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 4.4. [PSR: Proposer team experience: Fare Card and Order Fulfillment]

APPENDIX 2.7

INSPECTION FUNCTIONALITY AND DEVICES

The System shall make available Inspection functionality and Devices. Each Inspection Device must be able to both Inspect and Validate on all MBTA and Regional Transportation Provider Transportation Services except paratransit.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.7 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Inspection Functionality and Devices general approach]

1. Interfaces, Modes, and Features

1.1 Interfaces and Security

The Inspection Device shall have functions including:

- 1.1.1 Reading Credentials on all forms of Media via a Reader, as described in Appendices 3.2, 3.3, and 3.4.
- 1.1.2 Reading traditional and two-dimensional bar codes from User driver's licenses and/or other forms of government issued identification.
- 1.1.3 A secure connection to the Communications Network, as described in Appendices 2.5 and 3.1.
- 1.1.4 A means for manual retrieval of information (i.e. when Device is offline or without power, as further described in Appendix 4.6).
- 1.1.5 A means for battery charging.
- 1.1.6 A means to print violation notices.
- 1.1.7 Identifying location as set by the Inspection Device User, and
- 1.1.8 Identifying location as set automatically based on GPS coordinates.

1.2 Modes and Features

The Inspection Device shall have the following modes, features and capabilities:

- 1.2.1 Login. Secure login and logout, as described in Appendix 3.1. Access to and use of the Inspection Devices shall be limited to MBTA-designated Inspection Device Users.
- 1.2.2 Assignment. All records created by an Inspection Device shall be associated with the following values: an Inspection Device User ID, GPS coordinates or bus/rail Stop ID, vehicle number, bus/rail route, run, block, Vehicle operator and direction (as applicable). The System shall automatically populate other assignment values once a single value is provided by the Inspection Device User; for example, if an Inspection Device User provides a Vehicle number, the System shall use all available data as further described in Appendix 3.10 to determine the coordinates, Stop ID, route number, route direction, run number, and block number.
- 1.2.3 Inspection mode. The Inspection Device shall Inspect Credentials housed on all Media, issue warnings and/or citations, scan identification as part of warnings and citations, and allow manual entry of required warning/citation data
 - 1.2.3.1 The Inspection Device shall provide visual and audio notifications of whether a Credential was successfully Inspected or not. If the Credential Inspection is

- unsuccessful and/or fails, the Inspection Device shall provide an error or status code with an explanation.
- 1.2.3.2 The Inspection Device shall have the ability to display an Inspection history for the Credential, including total Inspections and failed Inspections. The durations of the Inspection history shall be Configurable.
 - 1.2.3.3 For Media, the Inspection Device shall display the User's Account Balance, Pass Product(s), and other entitlements to use Transportation Services.
 - 1.2.3.4 The Inspection Device shall be capable of storing and displaying MBTA Inspection procedures, which shall be Configurable.
 - 1.2.3.5 The Inspection Device shall display summary System status, including to inoperative Gates, Validators and Fare Vending Machines, so as to allow the Inspection Device User to ascertain whether missing and/or inaccurate Data may be the result of a problem not attributable solely to the User.
 - 1.2.3.6 The combination of Inspection history and System status shall be displayed during Inspection, in addition to the Inspection result.
 - 1.2.3.7 The Inspection result shall be based on the above Data and all other System Data so as to reach a logical conclusion as to whether the User has complied with the Fare Policy at the point of Inspection.
 - 1.2.3.8 The process used to reach Inspection result conclusions shall have Configurable triggers to be established by the MBTA. Potential results shall include: Inspection passed; Inspection failed – warning recommended; Inspection failed – citation recommended; other.
 - 1.2.3.9 The Inspection Device User shall be able to override the suggested result action, and overridden instances shall be recorded by the Inspection Device with Configurable Data requested from the Inspection Device User.
- 1.2.4 Validation mode. The Inspection Device shall be capable of operating in a Validation mode to accept Validation Taps in the same manner and complying with all the same requirements as a Reader. Validation Taps on the Inspection Device may be used, without limitation, at Ferry Terminals, during Special Events, or at low volume Commuter Rail Stations, when Station Validators are not functioning
- 1.2.4.1 Validation mode shall apply the same rules and processes set out for Readers, and return the same feedback and Data as specified therein.
 - 1.2.4.2 The Inspection Device shall also be able to display statistics on the number of Validations that have been performed at a Station/Location when in Validator mode.
- 1.2.5 Record mode. The Inspection Device shall be able to record a list of Accounts through Taps on the Inspection Device in order to compile lists of affected Users when a MBTA Service Failure occurs; the Taps shall be able to be tagged with the MBTA Service Failure description.
- 1.2.5.1 The Proposal shall identify how this will be satisfied without compromising the requirements of Appendix 3.1A. [PSR: Proposed Inspection Device]
- 1.2.6 Test mode and status information. The Inspection Device shall be able to display diagnostics, configuration, verify databases, communications, battery, proper operation of printer, reader and software. The Inspection Device shall display time of last update of local databases, battery life, communications status, and versions.
- 1.2.7 Usability. All Documentation, input prompts, error codes, status updates and other information available to the Inspection Device User shall be provided in a simple, plain manner, and not require the use of additional manuals or Documentation to be understood.
- 1.2.8 Tracking and remote disablement. The System shall be able to track and display to the MBTA the GPS location and status (login, mode, faults if any) of all Inspection Devices. If

an Inspection Device is reported lost or stolen, the System shall have the ability to remotely disable the Inspection Device, permanently purge/delete/destroy any Data residing on the Inspection Device, and render the Inspection Device unusable unless re-enabled by the SI.

2. Device Data, Performance and Form

2.1 Device Data

The Inspection Device shall be able to collect, store, access and display the following Data in the various modes described above:

- 2.1.1 Tap Data. All Taps made using a presented Credential shall be used by the System to allow for determination of a violation and display of that determination on the Inspection Device. This determination shall draw from all available sources of Tap Data and detect whether sources of Tap Data are available.
- 2.1.2 Account information. If the Inspected or Validated Credential is linked to a User belonging to a Reduced Fare Group, as defined in Fare Policy, names and photos shall be returned and displayed for identification purposes. No other Account information will be accessible from the Device except as otherwise described in this Appendix 2.7.
- 2.1.3 Prior Inspections and violations. When presented with a driver's license or another form of acceptable government issued ID, the Inspection Device shall display a list of prior Inspections, warnings and violations related to that ID. Acceptable forms of ID and period of Inspection history shall be Configurable.
- 2.1.4 Driver's licenses. Driver's license number shall be collected on Inspection Devices for violations, but shall not be stored in the System, except as defined in Appendix 3.1A. Any other Personally Identifiable Information that shall be entered to issue a violation must also comply with Appendix 3.1A.
- 2.1.5 Upload Inspections and violations. Inspection, warning, and violation records (including those not linked to a driver's license) shall be stored immediately and securely in the System with Account Data.
- 2.1.6 The System shall prevent Inspection, warning, and violation records from being stored locally upon the Inspection Device once immediate processing required to prepare those records and transmission of the records via the Communications Network is complete.
- 2.1.7 Exempt from payment. Inspection Device shall collect interactions with Users exempt from Fare payment, including police and MBTA employees. The list of such exempted Users and Reduced Fare Groups will be Configurable by MBTA. This Data shall be uploaded immediately and stored on the System, and not be locally stored upon the Inspection Device.
- 2.1.8 Error log. Inspection Device shall create an error log for diagnostic purposes for Inspection Device error and warning events.

2.2 Performance and Form

The Inspection Device shall meet the below performance and form requirements:

- 2.2.1 Current. All Data (including Taps, Product purchases, and Account Data changes) shall be current when used by and displayed on an Inspection Device, in accordance with the Account Data Timeliness Standards.
- 2.2.2 Speed. The Inspection Device shall return the Inspection result or Validation feedback within 600 milliseconds.
- 2.2.3 Battery. The Inspection Device shall provide 10 continuous hours of operation, with the processor and display active at least 50% of the time.

- 2.2.4 Recharge. Sufficient recharging equipment and/or spare batteries shall be provided to support Inspection Devices covering all assigned services. A low battery warning is required.
 - 2.2.5 Weight. Weight, and ruggedness shall be suitable for purpose. Total weight shall be less than two (2) pounds.
 - 2.2.6 Single unit. The Inspection Device shall be a single integral unit, without any ancillary components. No wires can be exposed connecting any subcomponents.
 - 2.2.7 Holster. A holster or holder shall be provided for each Inspection Device.
 - 2.2.8 Printer. A printer shall be provided to print violation notices and must be integrated into the Inspection Device.
 - 2.2.9 All paper, consumables, cleaning supplies and similar System Elements for the Inspection Devices shall be provided by the SI as further described in Appendix 4.6.
 - 2.2.10 A Reader shall be integrated into the Inspection Device.
- 2.3 Special Requirements During Transition Period and Pilots
During the Transition Period and Pilots, to the extent that Readers accept AFC 1.0 Media, the Inspection Device shall also accept AFC 1.0 Media.

3. Proposal and Design Development

The Inspection Device will be subject to Design Review as described in Appendix 7.

- 3.1 The Proposal shall include an approach with detailed information about how the SI will develop an Inspection Device that will meet the requirements, including:
 - 3.1.1 Descriptions of representative devices delivered by the Proposer to other customers, including:
 - 3.1.1.1 Photographs or drawings;
 - 3.1.1.2 Specifications;
 - 3.1.1.3 Dimensions, weight; and
 - 3.1.1.4 Development history and versions.
 - 3.1.2 Screenshots and flows for representative devices delivered by the SI to other customers.
 - 3.1.3 Itemization of existing deployments of representative devices by agency and with quantities, by version.
 - 3.1.4 An explanation of lessons learned from experience with a previous Inspection Device deployment.
 - 3.1.5 Indication of how and why the SI would alter or replace any elements, subcomponents or functionalities of the representative device for purposes of the Project.
 - 3.1.6 An explanation of the design and development process the SI will use, and an explanation of how the SI will ensure that this process will result in all requirements of this Appendix 2.7 being satisfied.
 - 3.1.7 An explanation of how the SI will source hardware and maintain supplier relationships to ensure an adequate supply of hardware to support the requirements of this Appendix 2.7 and Appendix 2.8.
 - 3.1.8 The proposed approach to Inspection Device lifecycle management, including details on replacement cycles (including whether phased-in or fleetwide).
 - 3.1.9 The proposed approach to software development and continuity of experience across generations of devices.
 - 3.1.10 The proposed approach to ensuring compliant security and privacy protections in the context of potentially multiple hardware solutions.
- [PSR: Proposed Inspection Device Development Process]

- 3.2 The SI shall perform a live demonstration of the most similar such device used in an existing deployment delivered by the SI. Such demonstration shall be provided at the same time as the Customer-Facing Device demonstration described in Appendix 2.3. [Technical Proposal Evaluation: Demonstration]
- 3.3 During Conceptual Design Review, the SI shall:
- 3.3.1 Updated the proposed Inspection Device specifications described in Section 3.1 of this Appendix 2.7.
 - 3.3.2 Describe in detail what durability and physical form the Inspection Device will take and provide photographs or drawings, specifications, dimensions and weight of the Inspection Device.
 - 3.3.3 Explain what level and type of design, user testing, and field testing for suitability and durability has been applied to the Device.
 - 3.3.4 Identify expected durability limits.
 - 3.3.5 Describe the External Interface to exchange data between the Inspection Device and the MBTA Inspection violation tracking system.
- [CDRL: Inspection Device conceptual design]
- 3.4 For Preliminary Design Review and Final Design Review, the SI shall provide:
- 3.4.1 An update to the Inspection Device Specifications described in Section 3.3 of this Appendix 2.7;
 - 3.4.2 A prototype of the Inspection Device;
 - 3.4.3 A description of how the maintenance and self-reporting requirements described in Appendix 4.6 will be met for the Inspection Device; and
 - 3.4.4 A draft of the Inspection Device Documentation described in Section ~~5.14.1~~ of this Appendix 2.7.
- [CDRL: Inspection Device preliminary design] [CDRL: Inspection Device final design]

4. Availability, Lifecycle Management and Quantities

- 4.1 The SI shall provide the quantity of Inspection Devices required in Appendix 2.10. Sufficient devices and components must be provided to allow for spares and recharging devices, such that the quantity of Inspection Devices is constantly met.
- 4.2 The SI shall implement an Inspection Device lifecycle management plan prior to the Revenue Service Commencement Date (including replacement cycles as necessary) to ensure that all Inspection Devices:
- 4.2.1 Meet the requirements of this Appendix 2.7 and Appendix 2.3 in regards to capabilities, features, modes, form, performance, security and privacy protections at all times
 - 4.2.2 Operate with software and hardware providing a consistent user experience across all potential Inspection Devices
 - 4.2.3 Are orderable in the quantities and timeframes required by Appendix 2.8 at all times.
- [CDRL: Inspection Device lifecycle management plan]
- 4.3 Any proposed update or modification to Inspection Device software or hardware must progress through Design Review as described by Section 3 of this Appendix 2.7 and Appendix 7.

5. Support for Inspection Device Users

- 5.1 The SI shall provide support Documentation for Inspection Devices, including instructions for operating the Device, troubleshooting tips and a key to Device messages. Such Documentation

shall be provided prior to the Pilots and updated whenever updates are made to the Inspection Device. [CDRL: Inspection Device Documentation]

5.2 The SI shall provide training for Inspection Device Users as further described in Appendix 2.11.

6. Testing

6.1 Safety Testing

6.1.1 The Inspection Device shall be testing by the nationally recognized testing laboratory identified by the SI in the Submittal required by Appendix 2.3. The SI shall provide a copy of the test report thirty (30) days prior to the start of Pilot Phase 1. [CDRL: Device safety test report for Inspection Device]

6.1.2 Alternatively, the SI may provide copies of prior test reports that demonstrate that the proposed Inspection Device has been recently tested. Such Documentation shall be submitted to the MBTA for approval to waive testing requirements. [CDRL: Test waiver request]

6.2 User Testing

The SI shall demonstrate the usability of the Inspection Device during user testing, during Pilots and during the Transition Period and address usability issues, including by changing the User Interface, altering the design, modifying screen flows and updating support Documentation.

7. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.7. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.3. [PSR: Proposer team experience: Devices (except gate transition)]

APPENDIX 2.8

EXPANSION

The SI shall design the System such that it may be expanded where necessary to meet the future needs of the MBTA, and the SI shall implement all Expansions (as defined herein) in accordance with the Contract Standards, including all requirements set forth in this Appendix 2.8.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.8 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Expansion general approach]

1. General Requirements

- 1.1 System Elements implemented by the SI as part of any Expansion shall not require different means of interaction by Users than already-deployed System Elements. The System shall maintain compatibility across all System Elements, regardless of the timing at which each System Element is installed or activated. If multiple Variants of System Elements are installed concurrently as part of the System, the difference between the System Elements shall be imperceptible to Users. For any differences in User Interfaces of Expansion Devices which, subject to the reasonable review of the MBTA, will have a substantial impact on Users, the SI shall complete additional user testing as described in Appendix 2.16. Any additional rounds of user testing required as a result of Expansion Device Variants shall be done at no additional cost to the MBTA and not from the allotment described in Appendix 2.16.
- 1.2 The MBTA projects future growth and expansion through a variety of processes. Each growth or expansion program (vehicle procurement, system expansion, station renovation, etc.) is added to the rolling Capital Investment Program (CIP) annually. During the annual CIP development process, the SI shall work with the MBTA to determine the new System costs to be borne by the project, for inclusion in the estimated overall project cost, which new System costs shall be determined in accordance with Appendix 11 (Unit Rates and Change in Cost Methodology). The SI shall manage its supply chain to be able to make available sufficient Devices to meet the needs of all designated projects added annually to the CIP. The SI's obligations under this Section 1.2 are included in the base scope of the Contract Services and shall not require the issuance of any MBTA Change Notice or give rise to any entitlement in respect of Change in Cost hereunder; provided that, without limiting its obligations under this Section 1.2, the SI shall not be obligated to implement any Unplanned Expansion prior to the issuance of an MBTA Change Notice or Change Directive in respect thereof in accordance with Article 11 (Changes) of the Project Agreement.
- 1.3 Given the nature of the MBTA's role in serving the public, fast turnaround is important when public demand calls for Expansion. If the MBTA issues an MBTA Change Notice in respect of any Unplanned Expansion, the Implementation Proposal shall include delivery time commitments for each Device Type and Variant and each Reader to be acquired through such Unplanned Expansion, which delivery time commitments shall be of no greater duration than those set forth in Attachment 1 (Delivery time commitments) to this Appendix 2.8. The delivery time commitments set forth in Attachment 1 to this Appendix 2.8 reflect the maximum number of days from the date of authorization specified in any Change Order or Change Directive in respect of an Unplanned

Expansion to the SI's delivery of the Expansion Device or Reader to the Location designated in the applicable MBTA Change Notice.

- 1.3.1 The SI's Proposal shall include delivery time commitments based on the table provided in Attachment 1. [PSR: Unplanned Expansion delivery time commitments]
- 1.4 The SI shall be obligated to comply with all Key Performance Indicators in respect of all System Elements included in any Unplanned Expansion on the scheduled completion date for such Unplanned Expansion, as established in the applicable Change Order or Change Directive; provided that, any Change Directive in respect of an Unplanned Expansion shall establish completion dates consistent with the delivery time commitments set forth Attachment 1 to this Appendix 2.8.
- 1.5 Any new Devices, Key Performance Areas or Locations added to the System as part of a Planned Expansion or an Unplanned Expansion shall be covered by the provisions of Appendix 8 (Payment Mechanism). The SI shall propose any necessary changes to Appendix 8 (Payment Mechanism), including to Tables 4 and 5, as part of its Implementation Proposal for an Unplanned Expansion, and shall use the Key Performance Areas and Location Categories listed in Appendix 8 (Payment Mechanism) as of the Date of Award for a Planned Expansion.
- 1.6 The provision and installation of Devices for any Vehicle included in the Transportation Network as of the Date of Award is included within the scope of the SI Installation Work and shall not be considered an Expansion or a Change. The provision and installation of Devices for any Vehicles which are added to the Transportation Network following the Date of Award shall constitute an Expansion.

2. Planned Expansions

- 2.1 The following MBTA Location Expansions and Vehicle Expansions are included in the System as part of the base award of the Project Agreement and within the scope of the Implementation Work, subject to Section 11.1(D) of the Project Agreement. Each of these Planned Expansions is intended to be either underway or complete prior to the Full Service Commencement Date. Further details on each Planned Expansion are available in the Reference Documents.
 - 2.1.1 Blue Hill Avenue Station
 - 2.1.2 Downtown Crossing Elevator and Station Improvements
 - 2.1.3 Ruggles Station Platform
 - 2.1.4 Silver Line Gateway
 - 2.1.5 Wollaston Station
 - 2.1.6 Forest Hills Station Secondary Entrance
 - 2.1.7 Green Line B Branch Stop Consolidation
 - 2.1.8 Harvard Square Busway Rehabilitation
 - 2.1.9 Green Line Extension
 - 2.1.10 Newton Highlands Station
 - 2.1.11 Back Bay Station Renovations
 - 2.1.12 Courthouse Station
 - 2.1.13 Green Line Type 9 Vehicle Procurement
- 2.2 For each of the Planned Expansions:
 - 2.2.1 The associated plans and specifications for the Planned Expansion are available in the Reference Documents.

- 2.2.2 The SI shall account for the Planned Expansion in, for example, applying the Quantity Standards and developing the DB Plans and Specifications.
- 2.2.3 In its Proposal, the Proposer shall identify how many Devices of each Device Type and Variant will be incorporated in the Planned Expansion. [PSR: Details of Expansion projects included in the base award]
- 2.2.4 The SI shall plan for and implement additional rounds of project management and Implementation Work (both directly and by reflecting such options in the DB Plans and Specifications) to adapt to the actual schedules for the construction or renovation projects, including potentially removing, relocating, and re-installing equipment.
- 2.2.5 For the Planned Expansions relating to vehicle procurements, the SI shall install the Expansion Devices on Vehicles in accordance with the requirements of Appendix 2.12, and such work is within the scope of the Implementation Work.
- 2.2.6 All Transition Period and Installation requirements shall apply.
- 2.2.7 The MBTA will provide the SI with any available plans for each Planned Expansion to the extent they are not already included in the Reference Documents.
- 2.2.8 The SI shall research, gather, review plans and information about the Planned Expansions and perform whatever other analysis and work is needed for the SI to become fully familiar with each such project.
- 2.2.9 The MBTA reserves the right to require a person other than the DB Entity to perform the installation work in respect of a Planned Expansion, in which case, such Planned Expansion shall be excluded from the Criteria for Full Service Commencement, and the SI shall have all rights and responsibilities in respect of the performance of such installation work as it has hereunder in respect of the DB Installation Work.
- 2.2.10 The SI shall take all reasonable actions to ensure that the System is available at each new or renovated Location and on each Vehicle on or before the date that each such Planned Expansion opens to the public in Revenue Service. Such actions shall include timely delivery of System Elements to enable performance of the applicable DB Installation Work or equivalent and timely performance of all inspections, commissioning and all other SI Installation Work in respect of the Planned Expansion. For any new or renovated Location or Vehicle that opens to the public in Revenue Service on or after the Revenue Service Commencement Date, the terms of Appendix 8 (Payment Mechanism) will apply to the Location or Vehicle at the moment it opens to the public in Revenue Service. If a new or renovated Location or Vehicle opens to the public in Revenue Service after the Full Service Commencement Date, the MBTA shall have the right, through an MBTA Change, to require the SI to cause the System Elements in respect of such Planned Expansion to comply with updated versions of the standards listed in Sections 1.1, 1.2, and 1.3 of Appendix 2.3.
- 2.2.11 The SI shall adhere to the Quantity Standards as to each Planned Expansion regardless of whether design, construction or renovation project plans show any fare collection equipment. Where the project plans call for fare collection equipment different than what the Quantity Standards indicate, the SI shall use the project plans as a general guideline and request approval from the MBTA on specific interpretation of the Quantity Standards. [CDRL: Request for approval of Quantity Standards interpretation]

3. Other Expansion Requirements

- 3.1 For all Location Expansions, including the Planned Expansions:
 - 3.1.1 The SI, independently and through requirements included by the SI in the DB Plans and Specifications (or equivalent in respect of other Location Expansions), shall work closely with each Expansion project's teams and contractors (for example: design engineers,

- Vehicle manufacturers, general contractors) to align schedules and adapt the SI's System implementation timeline to the Location Expansion project.
- 3.1.2 All Gates installed as part of a Location Expansion shall meet the requirements of Gate Option 1 from the moment they are installed at a Location, including such that if the SI has not yet reached Revenue Service Commencement, the Gate allows exit.
- 3.2 Unplanned Expansions will be implemented through the MBTA Change procedures set forth in Article 11 (Changes) of the Project Agreement. Without limiting anything under Article 11 (Changes) of the Project Agreement, the SI shall implement any Unplanned Expansion in accordance with all requirements specified in this Appendix, as needed, in addition to any requirements specified in the applicable Change Order or Change Directive. The pricing of Devices and Readers shall be as specified in Appendix 11 (Unit Rates and Change in Cost Methodology). The Systems Integrator shall include in its Implementation Proposal for any Unplanned Expansion the cost of causing all System Elements to comply with updated versions of the standards listed in Sections 1.1, 1.2, and 1.3 of Appendix 2.3.
- 3.3 For Reader Expansions:
- 3.3.1 The System generally, and Readers specifically, shall be designed and implemented to maximize interoperability with devices from suppliers other than the SI.
- 3.3.1.1 The Proposal shall include an explanation of the Proposer's approach to maximizing interoperability, its actual experience offering Readers or other subcomponents for use in devices and projects managed by other firms, and its ability and willingness to commit to work with other device providers to make such interoperability successful. [PSR: Device interoperability approach]
- 3.3.2 The SI shall make Readers available for the MBTA to acquire from the SI for use in non-SI equipment to be installed and integrated into the System. Specifically, Readers shall be made available by the SI for MBTA (or third party) installation on transportation services or non-SI equipment that implements the Reader API described in Appendix 3.9.
- 3.3.3 Readers acquired through such Expansion shall operate as required by the Reader requirements and interact with the System in the same way as do all Readers provided by the SI for use in SI-provided Devices, except that all Readers acquired through Expansion shall have integral Communications Network connectivity, including whatever CN Equipment or CN Services are required, and shall not use any other network than the Communications Network defined in Appendix 2.5.
- 3.4 The Proposer shall explain in its Proposal how it will implement the maintenance and self-reporting requirements (including those described in Appendix 4.6) for Readers acquired through Expansion, and what other arrangements the SI will make with the operators of any non-SI equipment in which the Reader will be used. The SI shall familiarize itself with and plan for the MBTA's projected future growth in its project management and supply chain processes. [PSR: Plan for maintenance and self-reporting for Readers acquired through Expansion]

4. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.8. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.3, 2.4, 2.12, 2.13, 2.14, 2.16 and 5. [PSR: Proposer team experience: Implementation, Expansion, DB oversight and testing]

APPENDIX 2.9

ACCESSIBILITY AND LANGUAGE

All User Interfaces shall be usable by all MBTA Users. The System shall conform with all Accessibility and language requirements. The SI is responsible for ensuring compliance with all Applicable Accessibility Law throughout the Term.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.9 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Accessibility and Language general approach]

1. Applicable Accessibility Law

The requirements stated below shall be applied to all System Elements, including those not specifically described in these requirements.

All System Elements shall meet or exceed the requirements of Applicable Accessibility Law. Applicable Accessibility Law for purposes of this Agreement shall include Title II of the Americans with Disabilities Act, 42 U.S.C. §§ 12131 et seq.; 28 CFR Part 36, 49 CFR Parts 27, 37 and 38, the US DOT's ADA Standards for Transportation Facilities ("ADA Standards"), Federal Transit Administration interpretive guidance including FTA Circular 4710.1, M.G.L. c. 22, § 13A, 521 CMR 1 et seq., Information and Communication Technology (ICT) Standards and Guidelines issued pursuant to Section 508 of the Rehabilitation Act as adopted by the US Access Board and printed in the Federal Register on January 18, 2017, MassIT standards for software (<http://www.mass.gov/anf/research-and-tech/policies-legal-and-technical-guidance/it-policies-standards-and-procedures/ent-pols-and-stnds/accessibility-standards/enterprise-it-accessibility-standards.html>), and the standards or requirements as set forth herein.

2. Accessibility Principles

- 2.1 Customer-Facing Devices, including Fare Vending Machines (FVMs), Validators and Gates, should be located in a consistent manner across all Vehicles and Stations as much as possible to assist in navigation and ease of use.
- 2.2 All User Interfaces shall be configured intuitively by the SI to assist Users with cognitive and physical impairments.
- 2.3 Customer-Facing Devices shall provide for sufficient tolerance for error, including, for example, tolerances so that users with difficulty touching precisely may go back and repeat transactions easily.
- 2.4 User Interfaces shall allow for configurations based on a User Established Customizations as described in Appendix 2.3.
- 2.5 The SI shall staff an Accessibility specialist throughout the Term who will monitor the compliance of the SI with Applicable Accessibility Law and the requirements of this Appendix 2.9, and report

independently to the MBTA. The SI shall provide the name and qualifications of the Accessibility certification and compliance specialist on Proposal Form 2. [PSR: Proposal Form 2]

- 2.6 The System shall, whenever displaying Station lists on Sales Channels, utilize the MBTA API as a data source to display a wheelchair icon next to Accessible Stations.

3. Accessibility Requirements for System Elements

In addition to the above requirements and those described elsewhere in the Technical Requirements, special attention should be paid to the following specific requirements and situations.

3.1 Exemplar Requirements for Customer-Facing Devices

- 3.1.1 FVMs with operable parts are required to meet ADA Standards for ATMs / Fare Ticket Machines, including the following sections of the ADA Standards: 707.2 Clear Floor or Ground Space; 707.3 Operable Parts; 707.4 Privacy (headphone jacks and privacy screen); 707.5 Speech Output (audio instructions); 707.6 Input.
- 3.1.2 FVMs shall only require card interaction in a manner that avoids the User needing to pinch, pull or grasp a card while moving at a constant speed in order for the card to be read, as described in Appendix 2.3.
- 3.1.3 All operable parts of Customer-Facing Devices shall be located within the height limits specified by Appendix 2.3.
- 3.1.4 Gates are required to meet applicable ADA standards for doors and gates.
- 3.1.4.1 Gate replacement
If the SI chooses Gate Option 1 (as defined in Appendix 2.3), all Accessibility standards described in this Appendix 2.9 (including the placement requirements of Section 3.2) and Appendix 2.3 shall be met. The MBTA prefers that all Gates provide at least 36" clear width opening, but at least two Gates in each Gate Array shall meet that 36" width requirement, and with the Accessible Gates located at each end of each Gate Array.
- 3.1.4.2 Gate reuse
If the SI chooses Gate Option 2, Gate Option 3 or Gate Option 4 (as defined in Appendix 2.3), the SI shall work with the MBTA to improve and address Accessibility-noncompliant conditions at Gate Arrays. The MBTA aims to have at least two Accessible Gates (at least 36" clear as described in Appendix 2.3) in each Gate Array, and to eliminate and/or reduce conflicts in paths between those Gates and major entrances.
- 3.1.4.3 At all times between the start of Pilot Phase 1 and the Full Service Commencement Date, every Gate Array shall have at least one Accessible Gate to use AFC 1.0 Media, and at least one Accessible Gate to use Media (however these may be the same Gate if applicable). Please also see Appendix 2.3.
- 3.1.4.4 The SI's Proposal shall explain the configuration that will be used and the number and width of Gate openings for each Location, both during the Transition Period and in the final configuration. [PSR: Gate configuration]

3.2 Location and Placement

3.2.1 Station Lobby Existing Conditions

Several MBTA Station lobbies where AFC 1.0 Equipment is located have known or suspected Accessibility issues relating to the Accessible path to, and cross slopes and clear floor space in front of, existing customer-facing devices. The SI shall work with the MBTA to identify Locations where existing AFC 1.0 Gates and AFC 1.0 FVMs have Accessibility issues, and develop plans to address the issue, to the greatest extent feasible. The SI shall notify the MBTA upon determining that a Location includes Existing System devices with

Accessibility issues, which notification shall include the SI's suggested means of addressing the issue in accordance with Good Industry Practice, including any reasonable efforts that the SI can take to address the issue through the relocation of Devices within the Station. If the issue cannot be addressed through such reasonable efforts by the SI and the MBTA determines to address any such issue through Station modification, the Station modification shall constitute an MBTA Change; provided that the SI's obligations under this Section 3.2.1 to work with the MBTA to identify Accessibility issues, develop plans to address such issues and utilize reasonable efforts through relocation of Devices to address Accessibility issues are included within the scope of the Contract Services as of the Date of Award.

3.2.1.1 The SI shall explain its plan and approach to addressing Accessibility issues in accordance with this Section 3.2 in the Proposal. [PSR: Approach to address existing gate Accessibility issues]

3.2.2 Station Location

Customer-Facing Devices in Stations shall comply with Applicable Accessibility Law, including, among other things, that all Customer-Facing Devices be located on an Accessible route with cross slopes of no more than 1:48 and running slopes of no more than 1:12. Clear Floor Spaces (CFS) of 30x48 inches are required in front of each FVM at each entrance and can have slopes of no more than 1:48 in any direction. Customer-Facing Devices shall be placed on the Accessible path within a Station wherever possible. Reused AFC 1.0 Gates (as described in Section 3.1.4.2 of this Appendix 2.9) are not required to meet these requirements if devices are not relocated.

3.2.3 Locations not meeting Applicable Accessibility Law

No Devices may be installed at any Location that does not meet Applicable Accessibility Law unless otherwise permitted by the MBTA in its discretion; provided that, without limiting anything under Section 3.2.1 of this Appendix 2.9, if any Station requires modifications to address existing Accessibility issues, the MBTA shall either implement such modifications through an MBTA Change or permit the SI to locate Devices in the same place as Existing System devices are located in such Station.

3.2.4 Vehicle Validators

All on-Vehicle Validators shall be Accessible upon entry or exit of a Vehicle. At least one Validator on each Vehicle shall be reachable from each designated wheeled mobility device area. The Mounting locations for System Validation Equipment Submittal required in Appendix 2.12 shall show the location of the Validator location reachable from the designated wheeled mobility device area(s). [CDRL: Validator in wheelchair area]

3.3 Text and Audio

System Elements shall comply with all Applicable Accessibility Law pertaining to text and audio communications. For example, whenever communications utilize visual text messages for User Interactions, audio messages shall also be provided. Requirements for labels and audio are described further in Appendix 2.3.

3.4 Customer Support Software

The Customer Support Software shall meet the requirements of Applicable Accessibility Law.

4. Digital Accessibility

The System Website and Fare Card Mobile Application (if the SI elects to develop such application) shall comply with Applicable Accessibility Law and generally meet prevailing website best practices, as follows:

- 4.1 The System Website and Fare Card Mobile Application shall meet Web Content Accessibility Guidelines (WCAG) 2.0 AA.
- 4.2 The System Website and Fare Card Mobile Application shall meet Massachusetts state guidelines contained in: <http://www.mass.gov/anf/research-and-tech/policies-legal-and-technical-guidance/tech-guidance/accessibility-guidance/it-acquisition-access-compliance-program.html>
- 4.3 The System Website and Fare Card Mobile Application shall meet the standards in Section 508 of the Rehabilitation Act of 1973, as amended by the US Access Board in September 2016 and printed in the Federal Register on January 18, 2017.
- 4.4 The SI shall engage a website Accessibility specialist to audit the System Website and Fare Card Mobile Application for compliance with Accessibility requirements described in this Appendix 2.9 (“Digital Accessibility Audit”).
 - 4.4.1 The website accessibility specialist shall verify to the MBTA that all deliverables are compliant with Applicable Accessibility Law.
 - 4.4.2 The SI shall provide a plan for the Digital Accessibility Audit to the MBTA for approval ninety (90) days prior to the audit. The plan shall include the name and qualifications of the vendor and a description of the approach. [CDRL: Digital Accessibility Audit plan]
 - 4.4.3 The SI shall select a vendor that meets the requirements of the Statewide Contract for IT Accessibility Services, ITS61 in Category A or B.
 - 4.4.3.1 Qualified vendors are listed on the Commonwealth of Massachusetts website at <http://www.mass.gov/anf/research-and-tech/policies-legal-and-technical-guidance/tech-guidance/accessibility-guidance/it-accessibility-services-statewide-contract.html>.
 - 4.4.3.2 If the SI chooses a vendor not listed under Statewide Contract ITS61, the Digital Accessibility Audit plan shall describe how the selected vendor meets the same requirements as the vendors listed on ITS61. The requirements for ITS61 are described in the Request for Response for COMMBUYS bid number BD-16-1060-ITD00-ITD00-0000000706, which can be found on the COMMBUYS website at: <https://www.commbuys.com/bs0/external/bidDetail.sdo?docId=BD-16-1060-ITD00-ITD00-00000007067>.
 - 4.4.4 The Digital Accessibility Audit shall identify potential barriers for Users with sensory, physical, learning and other disabilities. The audit shall provide a report, including: description of the evaluation methods, identification of issues and associated guidelines, classification of issues by severity, and recommendations for resolving issues. [CDRL: Digital Accessibility Audit report]
 - 4.4.5 The SI shall resolve all issues identified in this report prior to the Pilots and shall provide a digital Accessibility Compliance Report with details of how the identified issues were resolved. [CDRL: Digital Accessibility Compliance Report]
 - 4.4.5.1 Where an issue is identified the resolution of which is either impossible or unduly burdensome, by either the MBTA or the SI, the SI shall work with and defer to the MBTA for approval.
 - 4.4.6 The Accessibility specialist shall repeat any tests required to confirm that issues have been resolved and shall provide an addendum to its Digital Accessibility Audit report. [CDRL: Digital Accessibility Audit report addendum]

5. Retail Reload Location Accessibility

The SI shall ensure that Retail Reload Locations meet Key Accessibility Criteria. Such Locations may not completely meet Applicable Accessibility Law but can nevertheless be approached, accessed, and utilized

to purchase or reload an Account by a person with a disability as easily as can an individual without disabilities.

5.1 Self-Certification

The SI shall distribute a survey to every potential Retail Reload Location vendor, based on the 2010 ADA Checklist for Existing Facilities (<http://www.adachecklist.org/checklist.html>). Attachment 1 (Key Accessibility Criteria) contains the Key Accessibility Criteria.

5.1.1 Vendors who confirm that Key Accessibility Criteria have been met shall be considered “self-certified” for participation as a Retail Reload Location. Key Accessibility Criteria includes the following items from the ADA Checklist:

5.1.1.1 The Retail Reload Location shall have at least one route from site arrival points that does not require the use of stairs. (Item 1.1)

5.1.1.2 The route shall be stable, firm and slip-resistant. (Item 1.13)

5.1.1.3 The route shall be at least 36 inches wide. (Item 1.14)

5.1.1.4 The route shall have a curb ramp (if it crosses a curb). (Item 1.19)

5.1.1.5 The Retail Reload Location’s main entrance shall be Accessible. (Item 1.37)

5.1.1.5.1 If the main entrance is not Accessible, the Retail Reload Location shall have an alternate entrance that is Accessible and can be used independently and during the same hours as the main entrance. (Item 1.39)

5.1.1.6 The clear opening of the Accessible entrance door shall be at least 32 inches. (Item 1.41)

5.1.2 The MBTA reserves the right to inspect any Retail Reload Location to evaluate the accuracy of the self-certification at any time.

5.2 Standard

The SI shall include as Retail Reload Locations only those Locations which have self-certified that they meet the Key Accessibility Criteria.

5.3 Inventory

The SI shall provide an inventory of POS Locations (described further in Appendix 2.10), including checklist responses and self-certification status of every Retail Reload Location. [CDRL: Accessibility status of each Retail Reload Location]

5.4 Management of Retail Reload Locations

The SI shall provide notification to Retail Reload Locations of Accessibility barriers brought to the SI’s attention through the self-certification, complaints or other means. If a Retail Reload Location does not make improvements to meet Key Accessibility Criteria, SI shall remove it from the Retail Reload Locations unless otherwise allowed by the MBTA in its discretion. Any Location which is removed shall be removed from the inventory within seven (7) days.

5.5 Timing

The addition of the Retail Reload Locations to the inventory of POS Locations and notification to retailers shall be complete prior to the Revenue Service Commencement Date. Prior to adding a new Retail Reload Location, the SI shall complete the self-certification, notify the retailer and update the inventory within three (3) months of the Location participating in System sales. SI shall update the inventory for existing Retail Locations when notified of a change to Accessibility status. A change may occur because of a complaint as well as self-reporting. [CDRL: Updated Accessibility status of each Retail Reload Location]

6. Maintaining Accessibility Compliance

6.1 Standard Updates

If the Applicable Accessibility Laws or standards listed in this Appendix 2.9 change over the course of the Term, the SI shall modify or replace hardware and software if directed by the MBTA. Any such direction shall be an MBTA Change.

6.2 Compliance Monitoring

The SI shall propose a compliance monitoring plan to ensure the System satisfies the terms of this Project Agreement and this Appendix 2.9, throughout the Term, which plan shall include, among other things, spot monitoring, reporting and addressing of non-compliance. [PSR: Accessibility compliance monitoring plan]

6.3 Transition Period and Installation

The System shall meet or exceed all requirements of the Applicable Accessibility Law during Installation, Pilots, the Transition Period, and thereafter, including clear floor space and slopes around Devices, usage of the Accessible Gate and the accessible AFC 1.0 Gate, and audio instructions.

6.3.1 The SI shall describe in the Proposal how this requirement will be met and compliance will be monitored throughout Installation, Pilots, and the Transition Period. [PSR: Accessibility compliance monitoring plan]

7. Language

7.1 General

Customer-facing written and spoken materials, including those on Fare Vending Machines, signage, the System Website, the Customer Support Software, audio functions, and text displays shall have provisions for languages other than English as described below.

7.1.1 Labels and directions on Customer-Facing Devices shall be provided in English as raised characters and Braille conforming with DOT ADA Standards 703 and 707.

7.1.2 Translations shall be reviewed by a US-based translator, use simple, explanatory terms and avoid high-level terminology.

7.1.3 The SI shall submit text and audio translations for MBTA review during Design Review for Customer-Facing Devices. [CDRL: Text and audio translations preliminary design]
[CDRL: Text and audio translations final design]

7.1.4 Upon the issuance of each new MBTA Title VI Report (triennially, last in 2014), the SI shall make required language updates to customer-facing materials within twelve (12) months.

7.1.4.1 Data on LEP populations shall be based on the updated MBTA Title VI Report.

7.1.4.2 Data on the population of the MBTA service area shall be based on the population of all municipalities in the most recent US Census or American Community Survey Data.

7.1.5 When applicable, the SI shall maintain compliance with the latest version of the MassDOT/MBTA Public Participation Plan (last updated 2014, http://www.mbta.com/uploadedfiles/Contact_Us/PPPAppendixCfromAPPENDICES_FINAL.PDF). Section 3.1 of this plan outlines the steps that must be taken before, during and after a public meeting, including steps to ensure participation by populations of limited English proficiency (LEP). Documents provided to the MBTA to assist in public outreach shall be delivered in Accessible formats as described by the plan. [CDRL: Public outreach supporting documents]

- 7.1.6 Non-Customer-facing Software display language may be provided only in English. The Administrator Interface and Inspection Device may be in English only.
- 7.2 Language Group A
- 7.2.1 Definition
- 7.2.1.1 Languages with LEP populations that account for greater than 1.0% of the total population of the MBTA Service Area.
- 7.2.1.2 In the 2014 MBTA's Title VI Report, this would include: Spanish, Portuguese and Chinese. Chinese translations shall use simplified characters when written and Mandarin and Cantonese dialects when spoken.
- 7.2.2 Applications:
- 7.2.2.1 Text on display screens of Fare Vending Machines, Validators and Gates.
- 7.2.2.2 Any enunciated speech from machines, including Customer-Facing Devices and the IVR.
- 7.2.2.3 System Website.
- 7.3 Language Group B
- 7.3.1 Definition
- 7.3.1.1 Languages with LEP populations that account for greater than 0.25% of the total population of the MBTA Service Area that are not included in language group A.
- 7.3.1.2 In the 2014 MBTA's Title VI Report, this would include: French Creole, Vietnamese, Russian and Mon-Khmer/Cambodian.
- 7.3.2 Applications:
- 7.3.2.1 Additional signage provided on the Gate or FVM exterior, indicating how a User can get assistance in using the unit.
- 7.4 Additional Languages
- The System Website, IVR and Customer-Facing Devices shall be able to be adapted to display additional languages as future modifications, beyond the languages required above. The MBTA may choose to add additional language translations as an MBTA Change, and the SI shall be capable of supporting such a Change.
- 7.4.1 The Proposal shall explain the SI's ability to implement additional languages in its Proposal. [PSR: Language capabilities]
- 7.5 Multi-Lingual Capabilities
- 7.5.1 Default to English. English shall be the default language for all text and audio and the System shall return to English after an interaction is completed or cancelled.
- 7.5.2 Switching languages. The option to change languages shall be active at all times during User Interaction with FVMs and the System Website.
- 7.5.3 User Established Customizations. User Interfaces shall allow for configurations based on User Established Customizations and coordinated with other attributes that allow for changes to language of on screen text and enunciated speech.
- 7.5.3.1 The Proposal shall explain the extent to which this is achievable. [PSR: Language capabilities]

8. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.9. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer

employed the approach or equipment proposed herein. [PSR: Proposer team experience: Accessibility and Language]

APPENDIX 2.10

QUANTITY STANDARDS

The SI shall provide a sufficient number of Devices and Points of Sale to meet the needs of all Users at all Locations and on all Vehicles. The standards set forth in this Appendix 2.10 (the “Quantity Standards”) define the requirements that must be met for the placement and quantity of Vehicle Validators, Station Validators, Gates, Fare Vending Machines, and Retail Reload Locations.

The SI shall provide Customer-Facing Devices, Inspection Devices and Points of Sale (Fare Vending Machines and Retail Reload Locations) in accordance with this Appendix 2.10 and all other Contract Standards, including all requirements related to Accessibility and language.

The Quantity Standards collectively are composed of two principles which together form the overall requirement: (1) Coverage Principle, and (2) Queuing Principle. The SI shall demonstrate compliance with each such principle in accordance with the Contract Standards.

Except as provided below in respect of the FVM Required Locations and the POS Required Locations, the estimates included in this Appendix 2.10 are for example purposes only, and the SI is required to independently evaluate and confirm all estimates and quantities.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.10 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer’s proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer’s approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA’s needs. [PSR: Quantity Standards general approach]

1. Process Requirements

1.1 Application

Subject to Appendix 5.4 and this Appendix 2.10, the Quantity Standards shall be met as of the Revenue Service Commencement Date and throughout the remainder of the Term.

1.2 Design Review

All Device quantities and Device layouts described in this Appendix 2.10 shall be subject to Design Review as described in Appendix 7.

1.3 Proposal Requirements

The SI shall demonstrate in the Proposal the method for meeting all aspects of the Quantity Standards. All calculations used by the SI to apply the Quantity Standards for purposes of the Proposal shall be based on ridership, Transportation Network, and demographic data for calendar year 2016; provided that the Planned Expansions (see Appendix 2.8) shall be treated in the calculations as already constructed or completed. Information concerning such data is available in the Reference Documents.

The SI’s Proposal shall include the following Proposal Submittal requirements (PSRs) described in this Appendix 2.10:

1.3.1 Quantity Standards general approach (introduction)

- 1.3.2 POS inventory methodology (Section 1.8)
 - 1.3.3 Approach to POS, including FVM Required Locations, POS Required Locations and Distributed Locations (Section 2)
 - 1.3.4 Device quantities, including FVMs, Gates, Station Validators and Vehicle Validators (Section 3)
 - 1.3.5 FVM Queuing Principle approach (Section 3)
 - 1.3.6 Retail Reload Location quantities (Section 3.2)
 - 1.3.7 Proposer Team Experience (Section 6)
- 1.4 Submittal Requirements
- The SI shall meet the following Submittal requirements during the Term:
- 1.4.1 Design Review

All Device quantities and Device layouts described in this Appendix 2.10 shall be subject to Design Review. The Design Review process shall be complete in respect of Device quantities and layouts prior to the finalization of the Complete DB Plans and Specifications pursuant to Appendix 2.13.

 - 1.4.1.1 Conceptual Design Review

Conceptual Design Review of the Quantity Standards shall be based on Proposal Submittals listed in Section 1.3 of this Appendix 2.10.
 - 1.4.1.2 Preliminary Design Review

For Preliminary Design Review, the SI shall:

 - 1.4.1.2.1 Incorporate any feedback provided during the Conceptual Design Review;
 - 1.4.1.2.2 Coordinate review of Device layout in Stations Submittals with other Station plans and designs;
 - 1.4.1.2.3 Provide detailed calculations for the FVM Queuing Principle (Section 3.1.1.3);
 - 1.4.1.2.4 Update the Device quantities for Gates, Fare Vending Machines, Station Validators and Vehicle Validators as described in this Appendix 2.10.;
 - 1.4.1.2.5 Provide the detailed Device layouts, including Gate, Station Validator and FVM (for FVM Required Locations, POS Required Locations and Distributed Locations) layouts as described in this Appendix 2.10.
 - 1.4.1.3 Final Design Review

For the Final Design Review, the SI shall:

 - 1.4.1.3.1 Provide final Device quantities, and Device layouts.
 - 1.4.1.3.2 Provide an updated list of Retail Reload Locations. [CDRL: Updated Retail Reload Locations]
 - 1.4.2 Points of Sale Updates

The SI shall update required information about Points of Sale as required by Sections 1.8, 3.1.6, 3.2.2.1 of this Appendix 2.10.
 - 1.4.3 Acceptance

The SI shall demonstrate compliance with the Quantity Standards in all respects to the reasonable satisfaction of the MBTA at Final Design Review and as part of the Criteria for Revenue Service Commencement. The MBTA, acting reasonably, may reject the submission if the proposed quantities and layout cannot meet any aspect of the Quantity Standards. [CDRL: Quantity Standards acceptance submission]

1.4.4 Reporting

Quantity Standards analysis must be performed and reported to the MBTA on a quarterly basis, the first iteration of which must be accepted by the MBTA before Transition Period Completion. [CDRL: Quantity Standards compliance reports]

1.5 Updated Data

All calculations used by the SI to apply the Quantity Standards for updates beginning one year after Transition Period Completion shall be based on ridership, Transportation Network and demographic data for the previous 12 months, as collected by the SI. Updating as described in Section 1.7 of this Appendix 2.10 shall be based on this updated data.

1.6 Location Expansions

In connection with any Location Expansion, the SI shall recalculate and reapply the Quantity Standards using the most current MBTA projections of ridership, Transportation Network changes, and SI-sourced demographic data relating to any new or renovated Stops and Stations included in any such Location Expansion, and the System will be required to meet the Quantity Standards in accordance with such calculations upon the completion date specified in the applicable Change Order or Change Directive.

1.7 Updates other than Location Expansions

The Quantity Standards are based on current understanding of the Transportation Network and ridership. The SI shall recalculate the Quantity Standards one year following Transition Period Completion and on each subsequent anniversary thereof to account for any demographic, Transportation Network, and ridership changes (for example, bus route changes or other development that changes ridership patterns), and the SI will have six (6) months after that recalculation to adjust to ensure compliance with the updated calculations of the Quantity Standards.

If any such assessment indicates that fewer Points of Sale are necessary to meet the applicable Quantity Standards, the SI may physically remove (and not simply cover, power-down or label) Points of Sale to the extent such Points of Sale are not necessary to meet the Quantity Standards. If any such assessment indicates that more Points of Sale are necessary to meet the applicable Quantity Standards, the SI will be required to provide additional Points of Sale to the extent necessary to meet the Quantity Standards. In either case, there will be no adjustment to the Availability Payments. Any work associated with removing, relocating or providing additional Points of Sale shall be considered maintenance work subject to all terms and conditions of Article 8 (Maintenance, Repair, Replacement and Handback) of the Project Agreement.

1.8 Inventory of POS Locations

The SI shall maintain an inventory of all active POS Locations, including Retail Reload Locations and Fare Vending Machines. [CDRL: Inventory of POS Locations]

1.8.1 The inventory of POS Locations shall be provided to the MBTA prior to Pilot Phase 1 and updated prior to Pilot Phase 2, as part of the Criteria for Revenue Service Commencement, as part of the Criteria for Transition Period Completion, and annually (on each anniversary of Transition Period Completion) throughout the Term. [CDRL: Updated inventory of POS Locations]

1.8.2 The inventory of POS Locations shall include geographic details for all Locations and the Accessibility status of each Retail Reload Location (as further described in Appendix 2.9).

1.8.3 The inventory of POS Locations shall identify, for each Location, the type of Location, based on the Location classifications used in this Appendix 2.10.

- 1.8.4 The inventory of POS Locations shall be provided to the MBTA in a format that will support publication and update of the information:
 - 1.8.4.1 on MBTA website (MBTA.com) as a list,
 - 1.8.4.2 on the MBTA website (MBTA.com) as a map,
 - 1.8.4.3 in print on quarterly-issued route schedules, and
 - 1.8.4.4 if the SI elects to develop a mobile application to meet the requirements of the Mobile Fare Card, on the Fare Card Mobile Application.
- 1.8.5 The SI's Proposal shall describe the format of the list and fields of the inventory and the approach for keeping it up to date. The SI shall propose a method for conveying information about nearest POS Locations to Users with and without smart phones. [PSR: POS inventory methodology]

2. Coverage Principle

The Coverage Principle requires the SI to place Points of Sale at Locations within the MBTA Transportation Network and the MBTA Service Area. Points of Sale may be provided via either a Fare Vending Machine or a Retail Reload Location at which Users may pay with cash or Payment Card, except as specified below.

To fulfill the Coverage Principle for Point of Sale Locations, subject to this Section 2, the SI may choose to provide a combination of Fare Vending Machines and Retail Reload Locations, or solely Fare Vending Machines. However, if no Retail Reload Locations are provided to meet the Coverage Principle, the Systems Integrator shall nonetheless be required to meet the obligations specified in Appendix 2.15.

The SI's Proposal shall explain its approach to POS. This Submittal shall include the SI's general approach and information on the Locations that Points of Sale will be provided or included in the DB Plans and Specifications. [PSR: POS Locations]

2.1 Definitions and General Requirements

2.1.1 Pedestrian Network Definition

The network of sidewalks and other pedestrian paths including those within Stations, parks, and private properties. This network excludes areas such as highways that lack pedestrian facilities. All distance measurements will be made on the pedestrian network unless otherwise noted.

2.1.2 Street Network Definition

The network of roadways and other paths open to motor vehicle travel including those within Stations, parking lots and private properties. This network excludes pedestrian-only facilities, and includes motor vehicle-only facilities.

2.1.3 Accessibility

Customer-Facing Device Locations that do not meet Applicable Accessibility Law may not be utilized in the Coverage Principle, absent approval by the MBTA in accordance with Appendix 2.9. Retail Reload Locations that do not meet Key Accessibility Criteria (as described in Appendix 2.9) may not be used to meet the Coverage Principle.

2.1.4 Fare Vending Machine Variants

Within the Coverage Principle multiple FVM Variants are permitted. For placement at FVM Required Locations, Full-Functionality FVMs shall be utilized for Gated Stations (Section 2.2.1), Commuter Rail Stations (Section 2.2.2), Light Rail Terminals (Section 2.2.3.1) and Bus Stops (Section 2.2.3.3). For placement at other FVM Required Locations (Surface Light Rail Green Line Stations and Bus Rapid Transit) and POS Required Locations and Distributed Locations, either Full-Functionality FVMs or Limited-Functionality FVMs may be utilized.

2.2 FVM Required Locations

At the Locations identified in Attachment 1 to this Appendix 2.10 as “FVM Required Locations”, the SI shall place Fare Vending Machines (FVMs) in accordance with the Queuing Principle, the requirements specified in this Section 2.2 and all other Contract Standards. A single Location may function to meet the requirement for multiple elements below. At all Locations, if there are available Transfers, FVMs shall be placed to allow access from each Mode without a change of grade.

The SI’s Proposal shall recite the FVM Required Locations and explain its approach to serving the FVM Required Locations. [PSR: POS Locations]

During Preliminary Design Review and Final Design Review, the SI shall provide the MBTA with detailed FVM layouts at each FVM Required Location. [CDRL: Detailed Device layouts] [CDRL: Final Device layouts]

2.2.1 Gated Stations

FVMs shall be located within the Station boundary of all Gated Stations (a subway or Silver Line Station with Gated access, not including Surface Light Rail and Silver Line Stations). It is acceptable for some Station entrances to have no FVM, as long as passengers traveling in all directions from the Station are able to access FVMs and the below Queuing Principle is met.

2.2.2 Commuter Rail Stations

FVMs shall be located within the Station boundary of all Commuter Rail Stations in the Zone labeled “Fare Zone 1A” as shown in the Reference Documents.

2.2.3 Bus and Surface Light Rail (Green Line and Mattapan Line)

2.2.3.1 Light Rail Terminals

FVMs shall be located within Station boundaries at all Surface Light Rail (Green Line and Mattapan Line) Terminals (defined as the end of a route, if not a Gated Station).

2.2.3.2 Surface Light Rail Green Line Stations

FVMs shall be located within Station boundaries at Surface Light Rail Green Line Stations such that 65% of all Surface Light Rail Green Line combined boardings and alightings are covered by the FVM Required Locations. As of fall 2015 MIT origin-destination-transfer model data (see Attachment 3), this includes Stations that serve more than 2,000 passengers combined boarding or alighting in both directions in a typical weekday.

2.2.3.3 Bus Stops

FVMs must be located at bus Stops (or groups of bus Stops and Light Rail Stops within 250 feet of each other) such that 25% of all combined bus boardings and alightings are covered by the FVM Required Locations. As of fall 2015 composite day data (see Attachment 2), this includes Stops that serve more than 3,900 passengers combined boarding or alighting in both directions in a typical weekday.

2.2.3.4 Bus Rapid Transit

FVMs must be located within 500 feet of any Bus Rapid Transit Stop or Station on the SL1, SL4 and SL5 routes.

2.3 POS Required Locations

At the Locations identified in Attachment 1 to this Appendix 2.10 as “POS Required Locations”, the SI shall place either Fare Vending Machines (FVMs) or a Retail Reload Location in accordance with the Queuing Principle, the requirements specified in this Section 2.3 and all other Contract

Standards. A single Location may function to meet the requirement for multiple elements below. Duplicate placement of Devices is not required if the Location is already covered by the FVM Required Locations requirements above. At all Locations, if there are available Transfers, the POS must be placed to allow access from each Mode without a change of grade.

The Proposal shall recite the POS Required Locations, explain the Proposer's approach to serving the POS Required Locations and provide a preliminary list of POS Required Locations to be served by FVMs. [PSR: POS Locations]

During Preliminary Design Review and Final Design Review, the SI shall provide the MBTA with detailed FVM layouts for each POS Required Location with an FVM. [CDRL: Detailed Device layouts] [CDRL: Final Device layouts]

2.3.1 Commuter Rail Stations

At least one Point of Sale must be located within the Station boundary of all Commuter Rail Stations such that 50% of all inbound boardings are covered by the combination of the FVM Required Locations and POS Required Locations. As of the 2012 CTPS Commuter Rail passenger counts (http://www.ctps.org/commuter_rail_counts), this includes Stations with greater than 550 daily inbound boardings.

2.3.2 Bus and Surface Light Rail (Green Line and Mattapan Line)

2.3.2.1 Bus Rapid Transit

At least one Point of Sale must be located within 650 feet of any Bus Rapid Transit Stop or Station.

2.3.2.2 Highest Ridership Location

At least one Point of Sale must be located within 650 feet of the highest ridership Stop on all bus and Surface Light Rail routes (combined boardings and alightings).

2.3.2.3 Bus Stops

At least one Point of Sale must be located within 1000 feet of bus Stops (or groups of bus Stops and Light Rail Stops within 250 feet of each other) such that 50% of all combined boardings and alightings are covered by the combination of the FVM Required Locations and POS Required Locations. As of fall 2015 Composite Day data (see Attachment 2), this includes Stops that serve more than 680 passengers combined boarding or alighting in both directions in a typical weekday.

2.3.2.4 D-Branch Stations

At least one Point of Sale must be located within 650 feet of any D-Branch Green Line Station.

2.3.3 Intermodal Transfer Stations

At least one Point of Sale must be located within 650 feet of Locations serving more than one MBTA Transportation Network Mode as described below. The POS must be located along the primary path between the connecting routes.

2.3.3.1 Commuter Rail and Bus

Pairs of Stations and Stops within 500 feet of each other that are either located in a high-density census block groups (as defined by the MBTA Service Delivery Policy – currently greater than 7000 people per square mile), or have Commuter Rail inbound boardings of greater than 250 per day.

2.3.3.2 Light Rail and Bus

Pairs of Stations and Stops within 500 feet of each other that are the only connection point between a bus route and a Light Rail branch (B, C, D, E or Mattapan).

2.3.4 Ferry Terminals

At least one Point of Sale must be located within 650 feet of any Ferry Terminal.

2.4 Distributed Locations

At the following Locations (the “Distributed Locations”), the SI is required to place either Fare Vending Machines (FVMs) or a Retail Reload Location as required by the Queuing Principle, the requirements specified in this Section 2.4 and all other Contract Standards. These Locations must be determined by the SI. A single Location may function to meet the requirement for multiple elements below.

The SI’s Proposal shall describe its approach to serving Distributed Locations. [PSR: POS Locations]

During Preliminary Design Review and Final Design Review, the SI shall specify each proposed Distributed Location and provide the MBTA with detailed FVM layouts at each Distributed Location with an FVM. [CDRL: Detailed Device Layouts] [CDRL: Final Device layouts]

2.4.1 Commuter Rail Stations

At least one Point of Sale must be located at each Commuter Rail Station not covered by the FVM Required Locations and POS Required Locations as described above.

2.4.1.1 Stations with Parking

For Commuter Rail Stations with parking, a POS must be located within 1 mile of the Station, as measured by the street network.

2.4.1.2 Stations without Parking

For Commuter Rail Stations without parking, a POS must be located within 0.25 mile of the Station, as measured by the pedestrian network.

2.4.2 Bus and Surface Light Rail (Green Line and Mattapan Line)

All Bus and Surface Light Rail Users must be served by points of sale, based on the Trips the Users take. The SI must utilize available data (see Attachment 3) to determine the origin and destination of all Users utilizing Bus and Surface Light Rail Modes. The location of the POS must be based on the origin and destination of Users, however the requirement is based on the total number of Trips, regardless of origin and destination. All measurements will be made on the pedestrian network.

2.4.2.1 On a typical weekday, POS must be placed to ensure that 95% of applicable Trips have a POS within 1000 feet of the boarding or alighting point.

2.4.2.2 On a typical weekday, POS must be placed to ensure that 98% of applicable Trips have a POS within 2000 feet of the boarding or alighting point.

3. Queuing Principle

The Queuing Principle supplements the Coverage Principle by establishing the placement requirements for Devices and Retail Reload Locations within and around the broader Locations defined by the Coverage Principle.

3.1 Fare Vending Machines

3.1.1 In order to meet the Queuing Principle, the SI must provide enough FVMs (at Locations determined through the Coverage Principle above) to meet the following standards:

3.1.1.1 During Peak Operating Times, 80% of transactions at FVMs per day must be associated with a queue to access the machine no longer than 60 seconds; and 95% of transactions at FVMs per day must be associated with a queue to access the machine no longer than 120 seconds.

- 3.1.1.2 During times other than Peak Operating Times, 50% of transactions at FVMs per day must be associated with a queue to access the machine no longer than 60 seconds; and 75% of transactions at FVMs per day must be associated with a queue to access the machine no longer than 120 seconds.
- 3.1.1.3 During Preliminary Design Review, the SI shall provide an explanation of the calculations it uses to meet the Queuing Principle. [CDRL: FVM Location queuing calculations]
- 3.1.2 FVMs located within Stations shall always be provided in Arrays of at least 2 machines to provide for redundancy, unless the SI demonstrates to the reasonable satisfaction of the MBTA that space constraints make this impractical and that the Queuing Principle is otherwise satisfied.
- 3.1.3 FVMs shall always be located in non-Paid Areas of Stations.
- 3.1.4 FVMs shall be located at every area within a Location where there are AFC 1.0 FVMs as of the Date of Award, absent the express approval of the MBTA, acting reasonably.
- 3.1.5 At all Locations, if there are available Transfers, FVMs must be placed to allow access from each Mode without a change of grade and along the primary path between the connecting routes.
- 3.1.6 MBTA expects FVM usage to decrease over time. The SI must evaluate and report entries per FVM usage on a quarterly basis. [CDRL: FVM usage reports]
- 3.1.7 During Preliminary Design Review and Final Design Review, the SI shall provide the MBTA with detailed FVM layouts at each Location.

The SI's Proposal shall explain its approach to the FVM Queuing Principle and include an estimate of the number of Fare Vending Machines required to meet the Quantity Standards at each applicable Key Milestone. [PSR: FVM Queuing Principle approach] [PSR: Device quantities]

The SI shall update such quantities for Preliminary Design Review and Final Design Review. [CDRL: Updated Device quantities] [CDRL: Final Device quantities]

3.2 Retail Reload Locations

- 3.2.1 Coordination with vendor community
Retail limits must be established by the SI in collaboration with the retail vendor community or their representative so as not to pose an undue burden on these vendors, either in terms of proportion of sales or queuing lengths in stores.
- 3.2.2 Duration of hours
To be applicable for the Bus and Surface Light Rail elements of the Coverage Principle, Retail Reload Locations must be open for at least 75% of the service hours of the MBTA during a typical week. To be applicable for the Commuter Rail elements of the Coverage Principle, Retail Reload Locations must be open from 6am to 12pm on days when the Station has Boston-bound service.
 - 3.2.2.1 The SI shall update the Retail Reload Location service hours in the inventory of POS Locations prior to the Revenue Service Commencement Date and annually throughout the Term. [CDRL: Retail Reload Location hours annual update]

The SI's Proposal shall explain its approach to maintaining an adequate number of Retail Reload Locations in accordance with the Contract Standards. [PSR: Retail Reload Location quantities]

The SI shall update such quantities for Preliminary Design Review and Final Design Review. [CDRL: Updated Retail Reload Location quantities] [CDRL: Final Retail Reload Location quantities]

3.3 Gates

This Principle determines how many Gates are needed at a Gated Station entrance or exit, and how many Readers must be on each Gate.

3.3.1 Gates per Station

The SI may not elect to reduce the number of Gates in each Station or Array from the existing number of AFC 1.0 Gates unless approved by the MBTA, acting reasonably.

3.3.2 Readers per Gate

The following quantities of Readers are required on Gates within the Gated Station Transportation Network.

3.3.2.1 Standard width Gates

Two (2) Readers per Gate, one on the entrance side and one on the exit side.

3.3.2.2 Accessible Gates

Four points of presentment per Gate, two (2) on the entrance side, two (2) on the exit side, as further described in Appendix 2.3.

3.3.3 Exit-Only Locations

The Transportation Network includes two types of exit-only locations: those with barriers (“iron maidens”, emergency exits) and those where the passenger flow is exit-only, with no barriers.

3.3.3.1 Exit-only barriers. At least one Reader per barrier, with enough quantity and spacing to ensure limited queue lengths. Barriers that significantly limit throughput (“iron maidens”) should have a single Reader, while barriers that do not limit throughput should have two Readers per barrier.

3.3.3.2 Open exit areas. Rapid Transit Terminal areas without barriers to limit throughput (such as at Lechmere and Ashmont), must have Station Validators installed in accordance with Section 3.4 of this Appendix 2.10.

The SI’s Proposal shall explain its approach to determining the number of Gates and AFC 1.0 Gates that will be used by the System at the time of each applicable Key Milestone and after the completion of any Second Stage Work associated with the SI’s selected Gate Option(s). [PSR: Device quantities] This must be updated for Preliminary Design Review and Final Design Review. [CDRL: Updated Device quantities] [CDRL: Final Device quantities]

During Preliminary Design Review and Final Design Review, the SI shall provide detailed layouts of Gate Arrays by Station. [CDRL: Detailed Device layouts] [CDRL: Final Device layouts]

3.4 Station Validators

Station Validators are required at all Commuter Rail and Mattapan Line Stations. Additional Validators may also be required at Gated Stations to meet exit or transfer flows besides those located at Gates, as described in Section 3.3.3.2 of this Appendix 2.10.

3.4.1 Commuter Rail Stations

Validators may be placed along the platform, or along entrance and exit pathways to a Station (from the parking lot or adjacent streets).

3.4.1.1 Categories

Commuter Rail Stations are grouped into four categories by the MBTA for the purposes of this standard. More detail is located in the Placement Study provided in the Reference Documents.

3.4.1.1.1 Open Stations

Stations without barriers between platform and public spaces, and no defined paths for entering or exiting a Station.

- 3.4.1.1.2 Controlled Stations
Stations with barriers and boundaries between platforms and public spaces, including walls, fences, stairwells, doors or other gateways. All paths for entering or exiting the Station are defined.
- 3.4.1.1.3 Intermodal Transfer Stations
Stations with service to more than one Commuter Rail line, or a connection to Rapid Transit, Amtrak or MBTA Key Bus routes.
- 3.4.1.1.4 Termini
North and South Stations.
- 3.4.1.2 Placement
Validators may be placed along the platform, or along entrance and exit pathways to a Station (from the parking lot or adjacent streets). All Validators shall be placed in accessible areas in accordance with Applicable Accessibility Law. If there is a designated area for level boarding, at least one Validator must be placed there.
- 3.4.1.3 User Path Deviation
Validators shall be reachable by entering and exiting Users on a typical weekday with limited deviation from their normal path (the shortest or most easily navigated route of travel for a User). No deviations of greater than 85 feet (length of one coach) are permitted. In Controlled and Intermodal Transfer Stations, no Users shall be required to deviate. At Termini, up to 10% of Users may be required to deviate. At Open Stations, up to 50% of Users may be required to deviate.
- 3.4.1.4 Quantity
Quantity and spacing of the Validators must ensure that delays at Validators do not exceed 0.5 seconds per passenger on average. There must be at least two (2) Validators placed per Station platform.
- 3.4.1.5 Observation Points
To assist in enforcement, the quantity and placement of Station Validators must allow observation from limited locations within the Station Boundary. At Open Stations, all Station Validators must be observable from no more than two (2) points; at Controlled Stations, all Station Validators must be observable from no more than three (3) points; at Intermodal Transfer Stations, all Station Validators must be observable from no more than five (5) points; at Termini, all Station Validators must be observable from no more than seven (7) points.
- 3.4.2 Mattapan Line Stations
Validators may be placed along the platform, or along entrance and exit pathways to a Station (from the parking lot or adjacent streets). The Validators must be reachable by all entering and exiting Users on a typical weekday without a deviation of greater than fifty (50) feet (length of two coaches) from their normal path (the shortest or most easily navigated route of travel for a User). Quantity and spacing of the Validators must ensure that queue lengths at Validators do not exceed ten (10) seconds with a 95th percentile load. There must be at least one (1) Validator placed per Station platform and at least two (2) Validators in each Station area (for redundancy). All Validators must be placed in accessible areas in accordance with Applicable Accessibility Law. If there is a designated area for level boarding, at least one Validator must be placed there.
- 3.4.3 Gated Stations
Validators may be placed along the platform, or along entrance and exit pathways to a Station (from the parking lot or adjacent streets). The Validators must be reachable by all entering and exiting Users on a typical weekday without a deviation of greater than fifty

(50) feet from their normal path (the shortest or most easily navigated route of travel for a User). Quantity and spacing of the Validators must ensure that queue lengths at Validators do not exceed ten (10) seconds with a 95th percentile load. There must be at least one (1) Validator placed per Station platform and at least two (2) Validators in each Station area (for redundancy). All Validators must be placed in accessible areas in accordance with Applicable Accessibility Law. If there is a designated area for level boarding, at least one (1) Validator must be placed there.

The SI's Proposal shall explain its approach to determining the number of Station Validators in use by the System at each applicable Key Milestone. [PSR: Device quantities] This must be updated for Preliminary Design Review and Final Design Review. [CDRL: Updated Device quantities] [CDRL: Final Device quantities]

During Preliminary Design Review and Final Design Review, the SI shall provide detailed layouts of Validators by Station. [CDRL: Detailed Device layouts] [CDRL: Final Device layouts]

3.5 Vehicle Validators

Vehicle Validators are required on each Green Line vehicle and bus.

3.5.1 Green Line Vehicles

One Reader per end door, two Readers per mid-vehicle door, for a total of 10 Readers per Vehicle.

3.5.2 Buses

3.5.2.1 40 foot bus - 2 Readers per door – 4 Readers per Vehicle

3.5.2.2 60 foot bus - 2 Readers per door – 6 Readers per Vehicle

3.5.2.3 Trackless trolley – 2 Readers per right door, 1 Reader per left door – 5 Readers per Vehicle

The SI's Proposal shall explain its approach to determining the number of Vehicle Validators in use by the System at each Key Milestone. [PSR: Device quantities] This must be updated for Preliminary Design Review and Final Design Review. [CDRL: Updated Device quantities] [CDRL: Final Device quantities]

3.6 Queuing Principle Estimates

The following table estimates the number of Gates and Validators to serve the MBTA Transportation Network, as required by the Queuing Principle. The estimates included are for example purposes only. The SI is required to independently evaluate and confirm all estimates and quantities.

| | | Current Units | Estimated Readers/Validators |
|--------------------|---------------------|---------------|------------------------------|
| Gates | Standard Gates | 363 | 726 |
| | Accessible Gates | 138 | 552 |
| | Exit-only locations | 55 | 125 |
| Station Validators | Commuter Rail | N/A | 900 |
| | Mattapan Line | N/A | 30 |
| | Gated Stations | N/A | 45 |
| Vehicle Validators | Green Line vehicles | 221 | 2210 |
| | 40 Foot Buses | 1016 | 4064 |
| | 60 Foot Buses | 115 | 690 |
| | Trackless Trolleys | 28 | 168 |

4. Additional Quantity Requirements

4.1 Inspection Devices

The SI shall supply 800 Inspection Devices. They will be used for Commuter Rail, Light Rail, Rapid Transit and bus Inspection, and for Ferry Validation. All Inspection Devices must support both Inspection and Validation functions as specified in Appendix 2.7.

4.2 Model Office

The quantities of Devices needed to fulfill the requirements of Appendix 2.4 (Model Office) shall be provided by the SI in addition to the quantities described in this Appendix 2.10.

5. Title VI

The SI is responsible for assisting the MBTA with reporting for compliance with all aspects of Title VI of the Civil Rights Act of 1964. The MBTA reports once every three years on Title VI compliance (last in 2014) and as needed on fare and service changes.

5.1 Reporting

The SI must produce all data collected by the System that may be used by the MBTA to develop Title VI reports, including origin-destination data and demographic data, in both spreadsheet and GIS formats.

5.2 Monitoring

The SI shall monitor the placement of Devices (via the Coverage and Queuing Principles) for compliance with the goals and statements made in the MBTA's Title VI Report. Without limiting any requirement hereunder in respect of the Quantity Standards, the SI shall use all reasonable efforts to ensure that the Quantity Standards are met in a manner that will provide a level and quality of service to minority and low-income individuals and communities that is equivalent to the services provided to nonminority and non-low-income individuals and communities.

6. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.10. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach required herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.15. [PSR: Proposer team experience: Quantity Standards and retail]

APPENDIX 2.11

PROJECT MANAGEMENT AND SAFETY

The System shall be implemented, operated, and maintained in a manner consistent with all MBTA standards, generally-accepted project management processes, Good Industry Practice, and the Contract Standards. In addition and without limiting the foregoing, the following requirements shall apply during any Installation, including when any System Element is being installed, updated, overhauled, maintained, or otherwise changed. Project management must be completed in conjunction with other Installation, implementation, upgrade or maintenance requirements, including limitations on work hours or access, safety standards, change management and reporting.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.11 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Project Management and Safety general approach]

1. Overall Project Coordination

The SI shall provide overall planning and coordination of System implementation.

1.1 Management Team

The SI shall establish a robust management team to support the System throughout the Term. The SI shall have sufficient management resources and the necessary support staff to assure the MBTA that the SI's work will be properly coordinated and managed and that all required work will be complete in timeframes fully compliant with Contract Standards.

1.1.1 The SI's Proposal shall provide details about the management team members and structure in Proposal Form 2. [PSR: Proposal Form 2]

1.2 Project Management Plan

The SI shall develop and submit a Project Management Plan which includes:

1.2.1 An organization chart including a definition of levels of responsibility and authority, along with interplay with the MBTA and all Proposer Team members.

1.2.2 Methodology to control schedule.

1.2.3 An issue resolution and review process that comprehensively and explicitly details how all issues arising during implementation are identified, tracked and resolved.

1.2.4 Procedures and processes for exchanging information, documenting official correspondence and tracking progress.

1.2.5 Project Schedule. The SI shall develop, submit within thirty (30) days of the Effective Date and update throughout the Term a master Project Schedule identifying all activities, including:

1.2.5.1 Work item descriptions that convey the scope of the work indicated.

1.2.5.2 Consideration for the sequence, successor and predecessor relationships among the work items.

1.2.5.3 Identification of all dependencies, deliverables and critical path tasks. The Project Schedule shall include time-scaled network diagrams based on calendar days. The network diagrams shall be critical path method (CPM) precedence format and shall show the sequence and interdependence of activities required

for complete performance of all items of Implementation Work. A calendar shall be shown on all sheets along the entire sheet length. Each activity shall be plotted so that the beginning (and completion dates) of the activity can be determined graphically (by comparison) with the calendar scale. The detailed network diagram shall provide sufficient detail and clarity of form and technique so that the SI can plan, schedule, and control the Implementation Work properly and the MBTA can readily monitor and follow progress for all portions of the Implementation Work. The SI shall analyze the activities outlined in the detailed network diagram with respect to normal manpower and equipment requirements to determine activity time durations in units of whole working days. Critical path activities shall be identified, including critical paths for interim completion dates. Milestone events shall be identified and connected to the appropriate activity, denoting its start or completion, as applicable. Each start milestone event shall restrain the start of all dependent activities. Further, all activities included in the scope of work associated with a completion milestone event must be finished before that milestone event can occur. Interfaces and dependencies with preceding, concurrent, and follow-on work by others shall be included as milestone events.

- 1.2.5.4 The SI's Proposal shall include a preliminary Master Project Schedule, which is logically consistent, identifies dates for all Key Milestones and aligns with the Scheduled Transition Period Completion Date and the Scheduled Full Service Commencement Date. [PSR: Preliminary Project Management Plan]
[CDRL: Project Schedule]
- 1.2.6 A plan for adhering to the Project Schedule, including schedule monitoring and delay mitigation measures. [PSR: Preliminary Project Management Plan]
- 1.2.7 A risk management plan describing a process which continues throughout the Project with the monitoring of potential risks and a well-planned response to correct problems as they occur. [CDRL: Risk management plan]
 - 1.2.7.1 The SI's Proposal shall identify several risks the SI believes to exist in the Project and shall explain how the SI will minimize the likelihood of each being realized, how the SI will be prepared to respond to each in a way that minimizes or eliminates impact on schedule and outcomes, and how the SI's general approach to risk and project management aligns with these specific examples. [PSR: Preliminary Project Management Plan]
- 1.2.8 A plan for completing removal of AFC 1.0 Equipment (other than equipment being reused, where applicable) in accordance with the Contract Standards. [CDRL: Plan for removal of AFC 1.0 Equipment]
 - 1.2.8.1 The SI shall update the plan for removal of AFC 1.0 Equipment prior to the Revenue Service Commencement Date. [CDRL: Plan for removal of AFC 1.0 Equipment update]
 - 1.2.8.2 The SI shall notify the MBTA in writing that AFC 1.0 Equipment removal has been completed. [CDRL: Notification of AFC 1.0 Equipment removal completion]

The SI's Proposal shall include a preliminary Project Management Plan. [PSR: Preliminary Project Management Plan]

The SI shall submit an updated plan within thirty (30) days of the Effective Date. [CDRL: Project Management Plan]

1.3 Progress Meetings

The SI shall convene progress meetings with the MBTA and all of the SI's required team members in attendance, including representatives of Project Contractors and Subcontractors when necessary to address matters of implementation and as otherwise reasonably requested by the MBTA. The purpose of the meetings shall be to identify, report on and address as expeditiously as possible all issues arising during the course of the implementation. All issues raised during the meeting shall be addressed promptly and, if possible, resolved during the meeting. Open items shall be recorded on an action list for follow-up. The SI shall prepare formal agendas for each meeting and provide minutes recording the results of meeting activities. The SI will recommend and the MBTA will approve progress review meeting frequency based on the complexity and length of each implementation phase. Such meetings will occur at least twice per Month, and may include daily update calls if so requested by MBTA at any time. All meetings will be held on-site at the MBTA unless approved otherwise by the MBTA. [CDRL: Progress meeting schedule and agendas]
[CDRL: Progress meeting minutes]

2. Ongoing Project Management

2.1 Implementation Plan

An implementation plan shall be provided to the MBTA at least 30 Business Days before the start of any Installation or implementation, upgrade or maintenance of any System Element, hardware or software – excluding standard maintenance activities defined in Appendix 4.6. The Submittals required by this Section 2.1 shall be aligned with the Project Schedule and coordinated with all other related Submittals. The implementation plan shall include:

- 2.1.1 An organization chart, including definition of levels of responsibility and authority.
 - 2.1.2 The detailed process and Quality Assurance processes for all implementation activities
 - 2.1.3 A description of project management software and document control process, including the reports available to the MBTA.
 - 2.1.4 Checklists.
 - 2.1.5 A list of design documents and data to be developed.
 - 2.1.6 The level of MBTA support required for activities such as moving Vehicles to and from the installation Location.
 - 2.1.7 Approvals expected.
 - 2.1.8 Key Personnel.
 - 2.1.9 Quality Assurance demonstration schedules.
 - 2.1.10 Flagging protection and other safety provisions.
 - 2.1.11 Integration of the Complete DB Plans and Specifications.
- [CDRL: Implementation plan]

The SI's Proposal shall include a preliminary/summary implementation plan for the overall Project.
[PSR: Preliminary/summary implementation plan]

2.2 Quality Assurance

Alongside each implementation plan, a Quality Assurance (QA) plan shall be submitted. The QA plan must be part of an Agreement-wide ISO 9001:2015 quality assurance/quality control system, and is subject to MBTA approval. Subcontractors, vendors and all personnel must be included in and conform to the QA plans. [CDRL: Quality Assurance plan]

2.3 Time Impact Analysis

Whenever the SI receives an MBTA Change Notice or Change Directive or delays are experienced that may impact the critical path, the SI shall submit a time impact analysis illustrating the influence of each change or delay on the current Project Schedule completion dates. The SI shall include a time impact analysis in any Relief Request Notice submitted, or Implementation Proposal required, prior to the Full Service Commencement Date. The SI shall provide any other time impact analysis required under this Section 2.3 with the next required update of the Project Schedule that is at least fifteen (15) days following the date the delay is recognized. Each time impact analysis shall include a fragment network analysis, demonstrating how the SI proposes to incorporate the change or delay into the detailed network diagram required under Section 1.2.5 of this Appendix.

Additionally, the analysis shall demonstrate the time impact based on the date the Change is to be implemented or the date that the delay began, the status of Implementation Work at that point in time, and the event time computation of all affected activities. The event items used in the analysis shall be those included in the latest Project Schedule update or as adjusted by mutual agreement. In cases in which the SI does not submit a time impact analysis for a specific change or delay within the time requirements established under this Section 2.3, then it is mutually agreed that that the particular Change or delay has no time impact on any of the scheduled completion dates and the Project's critical path and no time extension will be granted.

2.4 Ongoing Management

On-going hands-on management of the System implementation phases must be provided by the SI. The SI must be able to provide prompt, in-person responsiveness to MBTA questions, comments and concerns at any time relating to Project implementation.

2.5 Network Access

The MBTA will not provide wired or wireless network connectivity to any SI Personnel for laptops and other technology. SI Personnel may not use any MBTA wired or wireless network connectivity. The SI is responsible for providing at its expense all laptops and mobile devices that SI Personnel may require to perform work.

3. Reporting and Documentation

3.1 Project Status Dashboard

The SI shall provide a continually updated dashboard in accordance with Good Industry Practice which provides a high level overview of the project status and highlights current issues.

3.1.1 Starting within thirty (30) days of the Effective Date and continuing until the Full Service Commencement Date, the Project status dashboard shall provide a high level overview of the System implementation progress, including:

3.1.1.1 Indicating progress toward milestones and status of overall timeline;

3.1.1.2 Laying out the steps required for the development and deployment of each System Element (e.g. stages of Design Review, testing and Installation) and the current stage of each System Element; and

3.1.1.3 Providing a percentage level of completion for each System Element.

3.1.1.4 Reporting on User complaints, as described in Appendix 5.1.

3.1.2 During Installation, the Project status dashboard shall include a schedule of Project site visits, as described in Appendix 2.14.

3.1.3 Starting from the commencement of the Pilots, the project status dashboard shall be supplemented by the System status dashboard (described in Appendix 4.5) and an overview

of data from the Automated Monitoring Subsystem and Supplemental Monitoring Process (as described in Appendix 4.6) to provide a high level overview of the System's health.

- 3.1.4 During the Transition Period, the dashboard shall include reporting on adoption rates as described in Appendix 5.1.

[CDRL: Project status dashboard]

The SI's Proposal shall include a sample project status dashboard. [PSR: Sample Project status dashboard]

3.2 Project Schedule Updates

The SI shall update the Project Schedule described in Section 1.2.5 of this Appendix 2.11.

- 3.2.1 Each Project Schedule update shall include the following elements:

- 3.2.1.1 Activity sort by preceding event number from lowest to highest, and then in the order of the following event number;
- 3.2.1.2 Activity sort by early start for next sixty (60) working days, then in order of preceding event number
- 3.2.1.3 Activity sort by late finish for next sixty (60) working days, then in order of preceding event number; and
- 3.2.1.4 Milestone status report to include current status of each milestone event.

- 3.2.2 Logic calculation configurations should be consistent throughout the Project. The SI shall use retained logic option, calculate start to start lag by using early start option, calculate early start using contiguous activity duration option, and calculate total float using most critical option.

[CDRL: Project Schedule update]

3.3 Document Control System

The SI shall provide a Document Control System, as described in Appendix 7. All documents submitted to the MBTA for review must be available through the Document Control System at any time, as well as reports on CDRLs and other Project Documentation.

- 3.3.1 Details of the proposed Document Control System, including its use to track Submittals as described in Section 3.4 of this Appendix 2.11 shall be provided in the SI's Proposal. [PSR: Description of Document Control System and Submittal tracking tool]

3.4 Submittal Tracking

The SI shall track the status of all Submittals and make this information available to the MBTA through a real time tracking tool on the Document Control System. The Submittal tracking tool shall be available within thirty (30) days of the Effective Date. Such Submittal tracking tool shall:

- 3.4.1 Refer to the Submittals using the names and Submittal ID numbers on the master Submittals list (Appendix 2.11 – Attachment 1);
- 3.4.2 Include scheduled delivery and review dates based on the SI's Submittal schedule (described in Appendix 7);
- 3.4.3 Include actual delivery and review dates, updated as they occur;
- 3.4.4 Track all submissions and resubmissions and responses from the MBTA, as applicable;
- 3.4.5 Include SI progress statuses and MBTA review statuses; and
- 3.4.6 At all times, be current on all Submittals due within the past sixty (60) days or the next ninety (90) days.

[CDRL: Submittal tracking tool]

4. Training

The SI shall implement a comprehensive program to educate and train all MBTA Persons and DB Entity Personnel expected to interact with System Elements.

- 4.1 Training shall cover each stage of the implementation, highlighting any differences that will exist during the Pilots, Transition Period and following the Full Service Commencement Date. Training shall focus on any interaction with System Elements that will be required to understand, use, support, troubleshoot and report issues with the System. Practical “hands-on” training using the actual System Elements shall occupy a significant portion of all training sessions where appropriate.
- 4.2 Instruction shall be tailored to the specific needs of each class of Personnel, including:
 - 4.2.1 DB Entity Personnel.
 - 4.2.2 Automated fare collections operations staff.
 - 4.2.3 Vehicle operators.
 - 4.2.4 Customer service agents.
 - 4.2.5 Call center staff and Administrative Point of Sales staff.
 - 4.2.6 Inspection Device Users.
 - 4.2.7 MBTA Police.
 - 4.2.8 Group program servicing staff.
 - 4.2.9 Reduced Fare Group Administrators.
- 4.3 Training sessions shall be scheduled to allow for completion before Personnel will be required to work with the System and to minimize lag time between training completion and actual use of skills.
 - 4.3.1 Training for DB Entity Personnel shall be completed prior to any DB Installation Work.
 - 4.3.2 A training program shall be delivered sixty (60) days prior to the start of Pilot Phase 1 for System Elements in use during the Pilots.
 - 4.3.3 A training program shall be delivered sixty (60) days prior to the Revenue Service Commencement Date for all other System Elements.
- 4.4 The SI shall provide qualified instructors, who shall be identified as part of the Proposer Team in Proposal Form 2. [PSR: Proposal Form 2]
- 4.5 The SI shall provide training locations accessible via the Transportation Network and compliant with Accessibility standards in Appendix 2.9.
- 4.6 The SI shall develop and produce all training materials, and supply such training materials for each trainee for each training session.
 - 4.6.1 Training materials shall include:
 - 4.6.1.1 Handouts, manuals, classroom aids and training aids.
 - 4.6.1.2 Video clips demonstrating the usage of each Device. Where major differences exist between Device Variants (as with FVMs), the video shall also depict the Variants.
 - 4.6.1.3 Manuals and Documentation with step-by step instructions, diagrams and examples as required.
 - 4.6.1.4 Support Documentation for the Customer Support Software (as described in Appendix 3.8), Inspection Devices (as described in Appendix 2.7), the Model

- Office (as described in Appendix 2.4) and the APIs (as described in Appendix 3.9).
- 4.6.1.5 Hands on or written practical tests designed to measure the extent to which students have met the learning objectives, with an answer key for each of the tests developed.
[CDRL: Training materials]
- 4.6.2 The SI shall deliver electronic versions of all training materials in both editable (e.g. Microsoft Office) and non-editable (e.g. PDF) formats to the MBTA. [CDRL: Electronic versions of all training materials]
- 4.7 The training program shall be subject to Design Review as described in Appendix 7.
- 4.7.1 The SI's Proposal shall include a summary of the training program. [PSR: Training program conceptual design]
- 4.7.2 During Preliminary Design Review, the SI shall submit a plan for the training program which includes:
- 4.7.2.1 General description of the training program.
- 4.7.2.2 Identification of all courses to be provided.
- 4.7.2.3 Summary course descriptions.
- 4.7.2.4 Targeted trainees for each session and prerequisite skills and knowledge of course trainees.
- 4.7.2.5 Maximum number of trainees for each session.
- 4.7.2.6 Lesson plans, detailing the objectives of each session, stated in measurable terms.
- 4.7.2.7 A description of instructional methods and learning activities.
- 4.7.2.8 Sequence of training activities.
- 4.7.2.9 Training schedule.
- 4.7.2.10 Description of training facilities.
[CDRL: Training program preliminary design]
- 4.7.3 During Final Design Review, the SI shall submit the training materials described in Section 4.6.1 of this Appendix 2.11. [CDRL: Training program final design]

5. Safety During the Implementation Period

Throughout the Implementation Period, the SI shall plan and implement safe access to all work sites for equipment, vehicles, staff and customers.

- 5.1 Safety Certification Plan
The SI shall prepare and execute a safety certification plan for all implementation activities.
[CDRL: Safety certification plan]
- 5.1.1 The safety certification plan shall be consistent in all respects with MBTA standards as shown below and in Attachment 2 (Safety Certification Program) and Attachment 3 (Configuration Management and Control Program).
- 5.1.1.1 For purposes of applying Attachment 2 (Safety Certification Program) and Attachment 3 (Configuration Management and Control Program), the SI will serve in the role of the MBTA, except with respect to SI oversight.
- 5.1.2 The plan is subject to Design Review as described in Appendix 7.
- 5.1.2.1 The Conceptual Design Review shall focus on the SI's approach to developing safety plans. In the Proposal, the SI shall include a description of the approach the SI will use to undertake the work required for the safety certification plan and safety certification, including what Key Personnel will be involved, how

- the SI will become acquainted with MBTA procedures and standards, and how the SI will train all SI Persons. [PSR: Safety certification plan conceptual design]
- 5.1.2.2 The Final Design Review shall be completed and the safety certification plan must be accepted by the MBTA at least thirty (30) days prior to the intended start of the work addressed.
[CDRL: Safety certification plan preliminary design] [CDRL: Safety certification plan final design]
- 5.1.3 The safety certification plan shall be updated throughout the Project, and reflect the full breadth of program activities (design, manufacturing, Installation, use and maintenance).
- 5.2 The SI shall prepare a site-specific plan including health and safety for each Location where Implementation Work is to be performed. Proposals for safety supervision, flagging (railroad worker protection) and other protective or operational measures must be defined and approved by the MBTA. This shall be included in the System safety program plan described in Section 5.7.3.1.
- 5.2.1 The MBTA will designate an MBTA Person to serve as the point of contact for any safety-related issues at each Location. Said person must be notified by the SI in the event of a safety-related issue.
- 5.3 Implementation must minimize disruption to MBTA operations, as well as customers and neighbors. Normal or emergency pedestrian egress from Stations or Vehicles may not be impeded. Proper housekeeping must be maintained at all Locations and on all Vehicles, including proper storage of equipment and removal and containment of trash and debris.
- 5.4 All necessary staff shall be certified and trained to work safely on MBTA property and with MBTA equipment. All necessary staff shall be OSHA 10 certified and complete MBTA Right-Of-Way (ROW) training, as well as meet other local, Commonwealth and federal regulations for training.
- 5.5 Safety documents and regulations are applicable to both the staff designing, installing, manufacturing and maintaining System Elements, and Customers using and interacting with System Elements.
- 5.6 The SI shall provide the Occupational Safety and Health Administration (OSHA) Incident Rate (OSHA 300 Summary) for the last three years for the Project Contractor and key Subcontractors responsible for performing Implementation Work. [PSR: OSHA 300 Summary]
- 5.7 Safety Certification
- 5.7.1 The SI shall provide a quantifiable comprehensive safety certification of all safety critical System Elements prior to any Installation, which must be consistent with the safety certification plan described in Section 5.1 of this Appendix 2.11. The safety certification shall ensure that all known hazards have been mitigated to a mean time between hazardous events (MTBHE) and safety risk level that are consistent with all Contract Standards. This certification shall be updated as System Elements are updated. [CDRL: Safety certification of System Elements]
- 5.7.2 The defined categories of probability, severity and risk noted in Section 11 of this Appendix 2.11 must be used in the plan wherever these or similar terms are needed.
- 5.7.3 The following Documentation shall be provided to support the safety certification:
- 5.7.3.1 System safety program plan (SSPP) – detailing how all hazards related to the design and implementation of the System will be identified, mitigated, tracked and closed. [CDRL: System safety program plan]

- 5.7.3.2 Hazard list – identification of all potential safety hazards of Installation, use and maintenance of System Elements, including mechanical failures, electrical component failures, software errors or defects, environmental impacts, human error, maintenance impacts and operational conditions. [CDRL: Hazard list]
- 5.7.3.3 Preliminary Hazard Analysis (PHA) – based on the hazard list, defines the potential cause of safety hazards, the probability of the hazard, potential or proposed mitigation, and the residual probability and severity. [CDRL: Preliminary Hazard Analysis]
- 5.7.3.4 Hazard tracking log (HTL) – tracking of the status of all supporting Documentation for hazards in the PHA, updated and discussed at regular meetings as determined by the MBTA. [CDRL: Hazard tracking log]
- 5.7.3.5 Failure modes, criticality effects analysis (FMECA) – must be provided for all System Elements to support the safety certification. [CDRL: Failure modes, critically effects analysis]
- 5.7.4 Probability, Severity and Risk
 - 5.7.4.1 The defined categories of probability, severity, and risk noted in Section 11 of this Appendix 2.11 shall be used in any analysis done as required by this Section 5.7.4 wherever these or similar terms are needed. The safety risk index matrix in Section 11 must be used whenever acceptability is referred to or in question.
 - 5.7.4.2 Any unacceptable or undesirable safety hazards need to be mitigated to a point of lowest practical risk and tracked. Any hazards unable to be mitigated to an acceptable level must be proposed to the MBTA for determination. [CDRL: Hazards unable to be mitigated]
 - 5.7.4.3 For individual component failures used in the hazard analysis, the SI shall utilize published failure rates for equipment, such as MIL-HDBK-217F (Military Handbook – Reliability Prediction of Electronic Equipment). Use of field data may be used if approved by the MBTA.
 - 5.7.4.4 For software failure probability rates used in the hazard analysis, it shall be assumed that all software has a Safety Integrity Level (SIL) of zero as defined by EN-50128 (European Standard Equivalent: Railway applications – Communication, signaling and processing systems). For common mode failure of comingled or redundant software a Beta or common mode failure rate of one shall be assigned. Alternatively, if the SI can provide independent certification for a higher SIL level, this may be used if approved by the MBTA.
 - 5.7.4.5 Unless it is shown otherwise through daily test or preventative maintenance inspection, the “Time of Risk” for all failures shall be the life of the System.
 - 5.7.4.6 At a minimum, the Gate mechanisms, motion detection elements and all electrical connections that could impact User experience shall be categorized as a Category I hazard for elimination of hazards and reduction of risk.
 - 5.7.4.7 In addition to the general safety requirements of MIL-STD-882E (Department of Defense Standard Practice System Safety), the following guidelines shall be followed:
 - 5.7.4.7.1 Wherever required to perform as intended, the SI shall only utilize components with proven high reliability in a transit or similar environment.
 - 5.7.4.7.2 All Devices must fail safe. Any Device without a guaranteed fail safe must be assumed capable of failing in permissive modes.
 - 5.7.4.7.3 All safety sensitive System Elements shall be designed on the

- closed circuit principle.
- 5.7.4.7.4 All safety circuits not wholly within an enclosure shall be of a double-wire, double-break design.
 - 5.7.4.7.5 Loss of signal in System Elements controlled by variable level signals shall result in the most restrictive command.
 - 5.7.4.7.6 No combination of wires or components becoming grounded shall cause any safety system to change to a less restrictive condition.
 - 5.7.4.7.7 Electronics, cables and wiring shall be design with sufficient interference immunity to guarantee safe operation under all possible environmental conditions.
 - 5.7.4.7.8 The location of pins and wires of safety critical circuits in connectors shall be designed to minimize the possibility of unsafe conditions resulting from shorts to adjacent pins or wires.
 - 5.7.4.7.9 Safety critical components subject to wear shall not wear to permissive states within a period less than three times the standard maintenance period under the worst-case combination of duty cycle, environmental and all other influences.
 - 5.7.4.7.10 No mechanical lock or catch used as a safety critical device shall require electrical or pneumatic energy to remain locked.
- 5.7.4.8 Fire safety shall be achieved through adherence to the following requirements:
- 5.7.4.8.1 All components used in Devices shall be smoke, flame and toxicity tested to NFPA 130, 49 CFR part 238 and BSS 7239. Maximum smoke developed, maximum flame spread indices, and toxicity emission limits shall be detailed in the specifications. Waivers may be requested of the MBTA for items with minimal combustible content. [CDRL: Waiver request for item with minimal combustible content]
 - 5.7.4.8.2 All heat sources in Devices shall be protected with redundant levels of protection so that circuits are open before unsafe temperatures exist.
 - 5.7.4.8.3 Emergency egress must be provided through all Gates in a fail safe mode.

6. Safety During Operations and Maintenance on MBTA Property

In performing operation and maintenance services, the SI shall at all times conduct its operations in a safe manner, so as to ensure the safety of all SI Personnel, Users, MBTA staff, the general public and all other individuals.

- 6.1 All General requirements in Appendix 4.6 apply to all Project and Implementation Work equally as they do to maintenance work.
- 6.2 At least ninety (90) days prior to the Revenue Service Commencement Date, the SI must develop and submit an operations and maintenance safety plan which, at a minimum shall:
 - 6.2.1 Account for all elements of the safety certification program that may be relevant during O&M;
 - 6.2.2 Account for any lessons learned or incidents during implementation;

- 6.2.3 Provide for safe facility access procedures, emergency response and evacuation procedures, and health and safety generally; and
- 6.2.4 Provide for ongoing training needs and schedules for all SI Persons.
[CDRL: Operations and maintenance safety plan]
- 6.3 All necessary staff must be certified and trained to work safely on MBTA property and with MBTA equipment. All necessary staff must be OSHA 10 certified and complete MBTA Right-Of-Way (ROW) training, as well as meet other local, Commonwealth and federal regulations for training.
- 6.4 The SI shall, at its own expense, promptly take all precautions which are reasonable under Good Industry Practice or necessary to safeguard against risks.
- 6.5 The SI shall inspect, test, and maintain the MBTA property to a state of good repair.
- 6.6 MBTA may conduct oversight of any part of the SI's services to ensure full compliance with all regulatory requirements, the applicable portion of the MBTA's Safety Plan, Risk Reduction Program and other system safety programs, plans, initiatives, rules, policies and directives, as well as to ensure the safe conduct of all Contract Services.
- 6.7 The SI shall recognize that any accident or security incident has the potential of acutely affecting SI, field, Project Contractor and Subcontractor Personnel in addition to costs, time, and other resources. One of the primary goals of this Project Agreement is to ensure each person leaves the workplace each day returning home without injury.

7. Safety Hazard Management

- 7.1 The SI shall immediately notify the MBTA of unacceptable hazardous conditions or concerns. In the event that the SI becomes aware of an unsafe, non-secure, or potentially unsafe or non-secure condition on the service property or any service equipment, or otherwise related to the System, the SI shall inform the MBTA immediately. [CDRL: Notification of hazard]
- 7.2 The SI will include MBTA Safety and other MBTA designees in the SI's investigation, analysis, review, mitigation, prioritization and resolution processes.
- 7.3 A hazardous condition of any System Element or resulting from any Contract Services that needs immediate mitigation to prevent any immediate and further repetitive loss to MBTA assets or injury to persons shall be corrected immediately by the SI to the satisfaction of the MBTA.

8. Drug and Alcohol-Free Workplace

The MBTA is a drug-free workplace. All SI Persons are to be free of the effects of illegal drugs, alcohol, controlled substances or other prohibited substances when they are on Locations or performing Contract Services.

- 8.1 The SI shall develop and provide to the MBTA for approval a written drug-free workplace policy, compliant with 49 CFR Part 32 and 41 USC Sections 701, that notifies employees of the substance abuse policy, maintains an ongoing drug-free workplace, and establishes an employee education program. The drug-free workplace policy shall be provided within ninety (90) days of the Effective Date. [CDRL: Drug-free workplace policy]

- 8.2 The SI shall maintain a drug-free workplace and have an ongoing drug-free awareness program.
- 8.2.1 All SI Persons are prohibited from using, possessing, selling or distributing any drugs, alcohol, controlled substances or other prohibited substances when they are on Locations or performing Contract Services. The SI shall advise SI Personnel of this requirement and ensure that SI Personnel meet this “fitness for duty” standard.
- 8.2.2 The SI shall remove violators of the drug-free workplace policy immediately from the MBTA property and such Personnel shall be held out of performing services or any other agreements held with MBTA.
- 8.2.3 The SI shall furnish the MBTA with a written report of any drug-free workplace policy violations, within five (5) days of the violation. [CDRL: Drug-free workplace policy violation report]
- 8.2.4 The SI shall have a return to work program, through the SI’s Employee Assistance Program, for SI Personnel that test positive for drug and alcohol use. For SI Personnel who are returning to work following the completion of a return to work program, the SI shall medically certify that the SI Personnel is fit for duty. The SI shall inform the MBTA of such certifications and return to work of such SI Personnel and shall maintain and make available such certifications for review by the MBTA. [CDRL: Drug-free workplace policy violator return to work certification]
- 8.2.5 The SI shall establish appropriate drug and alcohol testing programs for all SI Personnel. These programs shall be in full compliance with applicable regulations set forth by the FTA in 49 CFR Part 655 and 49 CFR Part 40 governing the control of drug use and alcohol abuse in railroad and/or transit operations. The program shall also provide for random testing of SI Personnel. [CDRL: Drug and alcohol test guidelines]
- 8.2.6 The SI shall update the drug and alcohol test guidelines annually, and submit the update no later than August 1st of each Contract Year. [CDRL: Drug and alcohol test guidelines update]
- 8.2.7 The MBTA shall be notified of all failures within five days of each test failure and the disposition thereof. [CDRL: Notification of drug and alcohol test failure]
- 8.2.8 Subject to all Commonwealth and federal laws and regulations, the MBTA will have full access to all drug and alcohol tests conducted on SI Personnel working on MBTA property or providing services. [CDRL: Drug and alcohol test results]
- 8.2.9 The SI shall, upon reasonable suspicion and consistent with the MBTA’s drug and alcohol testing policy, conduct drug and alcohol testing of any SI Personnel not governed by federal regulations for drug and alcohol abuse in railroad and/or transit operations.
- 8.2.10 Drug and alcohol testing shall be considered standard protocol following any incident on Locations or during the provision of Contract Services.
- 8.3 The MBTA reserves the right to bar any SI Personnel from performing services under this Project Agreement after a second positive drug and/or alcohol test.
- 8.4 The SI hereby accepts all liability arising from violation of this policy by SI Personnel, including the Personnel of Project Contractors or Subcontractors.

9. Safety and Security Planning and Reporting

- 9.1 Open Process for Safety and Security Planning
The SI shall not implement any safety or security related policies, processes or procedures without the explicit review and authorization of the MBTA. The only exception to this requirement is in the interest of averting a repeat incident within the immediate timeframe.

9.2 Safety and Security Reporting

- 9.2.1 The SI shall provide to the MBTA, all records and reports pertaining to the safety compliance and competency testing of all categories of its employees.
- 9.2.2 The SI shall provide to the MBTA, all records and reports pertaining to any inspections of equipment and facilities that are conducted by the SI in the execution of the Contract Services.
- 9.2.3 The SI shall alert the MBTA to any hazardous conditions for which corrective actions need to be implemented to avoid further degradation to the efficacy of the equipment or facility or to avoid injury or loss of life to SI Personnel, Users, MBTA Personnel, Project Contractors, Subcontractors, or populations in communities on or adjacent to the service area, the Locations, and elsewhere that the SI provides services.

10. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.11. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 4.3, 4.5 and 4.6. [PSR: Proposer team experience: Management, maintenance and reporting]

11. Probability, Severity and Risk Definitions

11.1 Hazard Severity Categories

Catastrophic – I – Death, permanent total disability

Critical – II – Permanent partial disability, severe injury or occupational illness

Marginal – III – Injury or occupational illness resulting in loss of 1-2 work days

Negligible – IV – Injury or illness not resulting in lost work days

11.2 Hazard Frequency Levels

Frequent – A – Continuously expected throughout system life

Probable – B – Will occur frequently throughout the life of the system

Occasional – C – Will occur several times throughout the life of the system

Remote – D – Unlikely but can be reasonably expected to occur

Improbable – E – Unlikely to occur in the system life, but possible

11.3 Safety Risk Index Matrix

| | Catastrophic (I) | Critical (II) | Marginal (III) | Negligible (IV) |
|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Frequent (A) | Unacceptable | Unacceptable | Unacceptable | Acceptable with MBTA review |
| Probable (B) | Unacceptable | Unacceptable | Undesirable | Acceptable with MBTA review |
| Occasional (C) | Unacceptable | Undesirable | Undesirable | Acceptable |
| Remote (D) | Undesirable | Undesirable | Acceptable with MBTA review | Acceptable |
| Improbable (E) | Acceptable with MBTA review | Acceptable with MBTA review | Acceptable with MBTA review | Acceptable |

APPENDIX 2.12

VEHICLE INSTALLATIONS AND REMOVALS

The SI shall install System Validation Equipment on MBTA Vehicles and, as necessary, remove Existing System validators and fareboxes from MBTA Vehicles, in accordance with the requirements set forth in this Appendix 2.12 and all Contract Standards.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.12 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Vehicle Installations and Removals general approach]

1. Validation Equipment

The SI shall deliver and install System Validation Equipment on Vehicles in accordance with this Appendix 2.12 and all Contract Standards.

1.1 General

- 1.1.1 The SI shall provide all required wiring and service loops, cabling and hardware necessary to properly install and secure the System Validation Equipment in its planned locations.
- 1.1.2 To simplify installation and replacement, all applicable connection(s) to the System Validation Equipment shall use positively located connector(s), e.g. connectors that click and lock into place when fastened / installed.
- 1.1.3 For the supply wiring of individual System Validation Equipment, the SI shall use twisted twin wires from the distribution point, with either an outer protective jacket or run in flexible conduit to protect the supply wiring from burrs or sharp edges that may be encountered along the wire routings. For bus application, split-loom that meets all applicable standards outlined in SAEJ1455 may be used.
- 1.1.4 Any DC to DC Converter proposed by the SI, subject to Design Review as described in Appendix 7, shall be reliable and reasonably small enough to be mounted similarly to the power supplies used for the Vehicle main lighting strips. The SI should avoid Vehicle ceiling areas and any installation that could mechanically disturb the sound deadening material (shavings and chips, when drilled or chipped, may contain asbestos).
 - 1.1.4.1 The SI shall specify the location of any DC to DC converter to change and isolate the supply voltage from the MBTA Vehicle battery, if such a converter is required it shall be included in the SI's Proposal. [PSR: Wiring for System Validation Equipment conceptual design]
- 1.1.5 The System Validation Equipment shall not interconnect with any existing or future technology on a Vehicle except as specifically identified in this Appendix 2.12, as allowed by the Communications Network requirements in Appendix 2.5, or at MBTA discretion and approval. Such technology with which the System Validation Equipment shall not interconnect includes computer-aided dispatch systems, automatic vehicle location systems, stop annunciation systems, video surveillance systems, and mobile access routers.
- 1.1.6 Pre-installation of wiring and System Validation Equipment is permitted in accordance with Vehicle availability requirements below, and with site preparation as described in Appendix 5.2.

1.2 Installation Plans

1.2.1 Vehicle Deployment, Installation and Interface Plan

1.2.1.1 The SI shall provide a detailed vehicle deployment, installation and interface plan that provides detailed descriptions of all aspects of the System Validation Equipment installation, including:

1.2.1.1.1 Site preparation, prototype installations, antenna testing, surveys, pre-wiring, System Validation Equipment staging and movements, scheduling and quality control;

1.2.1.1.2 Operational testing for all System Validation Equipment;

1.2.1.1.3 Detailed installation and configuration plans of all Software related to the System Validation Equipment and their respective schedules;

1.2.1.1.4 Identification of suitable locations, for approval by the MBTA, for the System Validation Equipment; and

1.2.1.1.5 A plan describing all aspects of System Validation Equipment installations on Vehicles, including exact locations and heights and methods.

1.2.1.2 The vehicle deployment, installation and interface plan shall be subject to Design Review as described in Appendix 7. The Final Design Review shall include a survey and prototype installation, as described in Section 3.6 of this Appendix 2.12. [CDRL: Vehicle deployment, installation, and interface plan conceptual design] [CDRL: Vehicle deployment, installation, and interface plan preliminary design] [CDRL: Vehicle deployment, installation, and interface plan final design] [CDRL: Vehicle deployment, installation, and interface plan]

1.2.2 Design of Wiring

1.2.2.1 The SI shall identify a definitive location on each Vehicle where the System Validation Equipment will be installed. The SI is responsible for installation of all low voltage cabling associated with the System Validation Equipment. All cabling and necessary modifications for the installation and integration of the System Validation Equipment with the existing Vehicle are the solely the responsibility of the SI.

1.2.2.2 The layout of all System Validation Equipment wiring shall be fully designed prior to any Installation and its procedure shall be provided for MBTA review as part of the vehicle deployment, installation, and interface plan prior to any Installation. [CDRL: Procedure for layout of all System Validation Equipment wiring]

1.2.2.3 To the maximum extent possible, all System Validation Equipment installed on Vehicles yet to be overhauled or in-process of being overhauled, shall be of the same installation design and configuration as overhauled Vehicles of similar types. Any deviations are subject to MBTA review and approval.

1.2.2.4 The design and layout of wiring for System Validation Equipment shall be subject to Design Review, as described in Appendix 7.

1.2.2.4.1 The SI's Proposal shall identify the point(s) of demarcation for each Vehicle type, conceptually and specify any DC to DC Converter required. [PSR: Wiring for System Validation Equipment conceptual design]

1.2.2.4.2 During Preliminary Design Review, the SI shall provide detailed information about the design and layout of the wiring, including the point(s) of demarcation, installation locations of the System Validation Equipment and cabling, proposed location(s) for a "wire link" to join the point(s) of demarcation to the low voltage supply, and any

differences between Vehicle types or based on the Vehicle's overhaul status. [CDRL: Wiring for System Validation Equipment preliminary design]

- 1.2.2.4.3 During the Final Design Review, the SI shall revise the design to incorporate MBTA feedback on the preliminary design. Final Design Review shall be completed prior to any Installation. [CDRL: Wiring for System Validation Equipment final design]

1.2.3 As-Installed Documentation

The SI shall supply reproducible "as-installed" drawings and procedures for the following items for each fleet prior to the Full Service Commencement Date. A fleet is defined as one or more Vehicles from the same manufacturer, of very similar configuration, often from the same order. The as-installed drawings and procedures shall include:

- 1.2.3.1 All SI and suppliers' drawings, details, bills of material, and catalog cuts that are required for all current and/or future installation, maintenance, and repair purposes.
- 1.2.3.2 All System Validation Equipment electrical schematics, electronic circuits, and wiring diagrams.
- 1.2.3.3 All interface control drawings, including those for any test equipment.
- 1.2.3.4 Any special purpose or proprietary tools fabricated by or for the SI which are required to access, open, or maintain the System Validation Equipment.

[CDRL: As-installed drawings and procedures]

2. Mounting Locations

- 2.1 The mounting of System Validation Equipment shall be positioned to minimize encroachment on passengers, entrances and aisles and shall not obstruct the operator's field of vision and view, including the view of the front door. The operator does not need to see the Validator, however placement of the Validator must not obstruct the operator's view of passengers.
- 2.2 Each front door Validator shall be initially installed and operable alongside the AFC 1.0 farebox. The SI shall reinstall the front-door Validator into a final location as part of the required farebox removal work on Vehicles.
- 2.3 The mounting of System Validator Equipment shall be positioned to minimize impact on existing Vehicle User Interaction points, including stop request buttons. Any changes to the location or use of stop request buttons shall be subject to MBTA approval, shall comply with applicable ADA law (49 CFR, Part 38.37), and shall not impact other on-board systems, such as chimes and announcements.
- 2.4 All mounting locations shall be subject to Design Review, as described in Appendix 7.
- 2.4.1 The Proposal shall describe its approach to mounting locations, including:
- 2.4.1.1 How the approach leverages the SI's familiarity with diverse transit Vehicle fleets;
- 2.4.1.2 Mounting location of the Validator reachable from the designated wheeled mobility device area(s) (as described in Appendix 2.9);
- 2.4.1.3 Mounting location during Transition Period and after farebox removal; and
- 2.4.1.4 Examples of on-vehicle validator mounting locations the SI has used elsewhere. [PSR: Mounting locations for System Validation Equipment conceptual design]
- 2.4.2 During Preliminary Design Review, the SI shall propose detailed mounting locations for each Vehicle type in the MBTA fleet. The preliminary design shall include any proposed

changes to stop request buttons. [CDRL: Mounting locations for System Validation Equipment preliminary design]

- 2.4.3 Final Design Review shall be completed and approved by the MBTA in advance of any Installation. [CDRL: Mounting locations for System Validation Equipment final design]

3. Testing and Certification

- 3.1 The SI shall be responsible for all required testing and corrective actions to ensure that the System Validation Equipment is in compliance with the standards set forth in this Appendix 2.12 and all Contract Standards. Such testing shall include, at a minimum, that defined in Appendix 2.16.
- 3.2 The SI shall inspect and test each installation prior to its use in Revenue Service.
- 3.3 Bus Use Certification
- 3.3.1 All System Validation Equipment deployed on a public service bus shall be type tested and certified by the SI as being suitable to operate in that environment as defined here and applicable to the MBTA.
- 3.3.2 The SI shall type test System Validation Equipment appropriately to SAE J1455.
- 3.3.2.1 The test procedure shall be provided to the MBTA prior to testing. [CDRL: Test Plan for System Validation Equipment on buses]
- 3.3.2.2 The test report shall be provided to the MBTA prior to the Installation Commencement Date. [CDRL: Test reports for System Validation Equipment on buses]
- 3.3.2.3 All System Validation Equipment tests on buses must be scheduled at a time and location, and with sufficient notice to the MBTA, that enables the MBTA to attend. [CDRL: Notification of test for System Validation Equipment on buses]
- 3.4 Rail Use Certification
- 3.4.1 All System Validation Equipment deployed on a railcar shall be type tested and certified as being suitable to operate in a rail environment as defined here and applicable to the MBTA.
- 3.4.2 The SI shall type test System Validation Equipment to IEC 60571 ed3 (2012) “Railway applications - Electronic equipment used on rolling stock”, with the System Validation Equipment set at Class T1. Note that this standard also refers to other IEC standards for rail Vehicles such as IEC 62236 for EMC, and IEC 61373 for shock and vibration.
- 3.4.2.1 The test procedure shall be submitted to the MBTA prior to testing. [CDRL: Test Plan for System Validation Equipment on railcars]
- 3.4.2.2 The test report shall be submitted to the MBTA prior to the Installation Commencement Date. [CDRL: Test reports for System Validation Equipment on railcars]
- 3.4.2.3 All System Validation Equipment tests on railcars must be scheduled at a time and location, and with sufficient notice to the MBTA, that enables the MBTA to attend. [CDRL: Notification of test for System Validation Equipment on railcars]
- 3.4.3 The SI shall ensure, and provide testing to verify, that all System Validation Equipment meets the required EMC standard and the following:
- 3.4.3.1 All System Validation Equipment shall be immune to radio frequency interference (RFI) and Vehicle inductive emissions.
- 3.4.3.2 Operation of the System Validation Equipment shall not be affected by the electromagnetic fields generated by traction power (overhead catenary or third rail), or by local high voltage power distribution lines.

- 3.4.3.3 Operation of the System Validation Equipment shall not be adversely affected by cell phones and communications equipment (walkie-talkies) within close proximity.
 - 3.4.3.4 System Validation Equipment components shall not emit RFI (frequencies other than its operating cell phone transmissions) that produces harmful interference with any other onboard electronic device or system.
- 3.5 Certification Documentation and Waivers
The SI shall provide copies of prior test certificates and reports that demonstrate that proposed equipment on specific vehicle types has been recently tested and complies with all specified standards of this Appendix 2.12 and all relevant Contract Standards. Such Documentation shall be submitted to the MBTA for consideration of waived testing requirements. [CDRL: Test certificates] [CDRL: Test waiver requests]
- 3.6 Survey and Prototype Installation
- 3.6.1 The SI shall perform a complete survey and prototype installation of each Vehicle type in the MBTA fleet as part of the Final Design Review for the vehicle deployment, installation and interface plan.
 - 3.6.2 MBTA approval will be required for Vehicle prototype installations.
 - 3.6.3 The survey and installation results documentation will be submitted to the MBTA as part of the vehicle deployment, installation and interface plan. [CDRL: Survey and prototype installation results]
 - 3.6.4 The vehicle deployment, installation and interface plan shall be approved before fleet-wide Installation of Fare Validation Equipment proceeds.

4. Vehicle Availability and Installation Locations

The MBTA will work with the SI to ensure Vehicles are reasonably available for SI's access and installation; however, Vehicle quantities may be effected by service demands, special events, weather and ongoing maintenance activities. The SI shall take those factors into consideration in planning and executing the work. The MBTA has provided Vehicle availability estimates to the SI for installation planning and scheduling purposes. The maximum quantity of MBTA Vehicles, will be determined by service demands, special events, weather and ongoing maintenance activities.

- 4.1 The SI may request access to Vehicles for prototyping and advance Installation work to assist with overall Installation or Pilots. The MBTA must approve any request for additional access, and such request must not interfere with MBTA Revenue Service needs.
- 4.2 A minimum quantity of MBTA Vehicles for Installation has been identified below for each Vehicle type and Location. The minimum quantity is the available 'float' of Vehicles for the SI to perform System Validation Equipment Installations during overnight hours (11:00PM – 5:00AM). Some other Vehicles at a Location may be available during overnight hours. This 'float' quantity may also be used for the planning of prototyping or advance Installation work.
- 4.3 All System Validation Equipment Installations shall occur during overnight hours. Any Vehicles above the below 'float' estimates would be provided only in a yard environment, with no cover or facility proximity.
 - 4.3.1 The SI's installation plan should have no impact to service demands.
 - 4.3.2 The SI's Proposal should outline the preferred installation plan for Vehicles to assist with MBTA planning purposes, including access to Vehicles above the 'float' availability. [PSR: Approach to Vehicle installation]

- 4.4 Green Line Vehicle Installations shall take place at one (1) Location. There are 221 Green Line Vehicles in total. MBTA will shuttle Green Line Vehicles to and from this central installation Location for the SI to perform installations. It is assumed that all installations will take place in an outdoor environment.
- 4.4.1 The MBTA predicts it can commit to providing the SI with a minimum quantity of 2 Green Line Vehicles per night during overnight hours for System Validation Equipment Installations. Additional Green Line Vehicles may only be provided, if approved in advance by the MBTA, after the SI has completed the SI Installation Work on those already made available to the SI.
- 4.5 Bus installations will take place at designated bus garages and/or garage property areas. Bus installations may require either an outdoor installation solution or movement of buses to another installation site due to space and access restraints.
- 4.5.1 The MBTA predicts it can commit to providing the SI with the minimum quantity of buses at the following Locations during overnight hours: 8 buses per night at Albany, Arborway, Cabot, Charlestown, Fellsway, Lynn and Quincy bus garages; and 4 buses per night at North Cambridge and Southampton. The following table is provided for reference:

Table 1: Bus garage detail

| | Bus garage | 40' Buses | 60' Buses | Peak Fleet Req. | Spare ratio | Minimum quantity of buses available overnight hours (Mon-Fri, 11PM - 5AM) | Other information |
|---------------------|----------------------|-------------|------------|-----------------|-------------|---|----------------------------|
| 1 | Albany | 116 | | 92 | 26.1% | 8 | Closed Fri 11PM - Sun 11PM |
| 2 | Arborway | 118 | | 97 | 21.6% | 8 | |
| 3 | Cabot | 180 | | 153 | 17.6% | 8 | |
| 4 | Charlestown | 254 | | 194 | 30.9% | 8 | |
| 5 | Fellsway | 76 | | 55 | 21.1% | 8 | Closed Fri 11PM - Sun 11PM |
| 6 | Lynn | 89 | | 75 | 18.7% | 8 | |
| 7 | North Cambridge | 28 | | 22 | 27.3% | 4 | Closed Fri 11PM - Sun 11PM |
| 8 | Quincy | 86 | | 59 | 45.8% | 8 | |
| 9 | Southampton | | 98 | 60 | 65.0% | 4 | |
| 10 | Currently unassigned | 69 | 17 | | | | |
| Total Buses: | | 1016 | 115 | | | | |

4.6 Location Coordination

SI must coordinate all on-Location Installation work and testing activities with designated MBTA Persons. The SI shall review and become familiar with MBTA policies, procedures and schedules and meet with designated MBTA Persons at each Location where the SI will be working. The specific procedures for on-Location Installation work and testing activities will vary depending on the work to be performed and the Location of the work. By way of example, the following procedures are the types which the SI must discuss and agree to for each Location:

- 4.6.1 Upon arrival at a Location and before performing any Installation work, the SI shall check in with a designated MBTA Persons (for example, the on-duty garage/repair foreperson). Just before departure from the Location, the SI shall also check out with the designated MBTA Persons.
- 4.6.2 The SI shall work, as appropriate, with designated MBTA Persons for certain areas with access restrictions, including: closets, rooms and facilities adjacent to an active right-of-way; and areas with controlled access points.
- 4.6.3 The SI shall work with designated MBTA Persons to determine the needs for worksite set-up and break-down at the start and end of any working period at each Location.
- 4.6.4 The MBTA will designate an MBTA Person to serve as the point of contact for any safety-related issues at each Location. Said person must be notified by the SI in the event of a safety-related issue, such as that described in Appendix 2.11.

5. Materials and Workmanship

5.1 Overview

- 5.1.1 The workmanship and Quality of the System Validation Equipment shall conform to industry best practices in all respects. All work shall be performed by qualified personnel, properly trained and skilled in the tasks they will be performing, and using correct tooling and procedures.
- 5.1.2 All materials shall perform safely and satisfactorily within their operating environment and in accordance with their intended functions and the requirements of this Appendix 2.12 and all applicable Contract Standards.
- 5.1.3 All new materials and components used in the installation of System Validation Equipment shall comply with the requirements of this Section 5.
- 5.1.4 Surfaces exposed to passengers, crew, or maintenance personnel shall be kept smooth and free of burrs, sharp edges or corners, and dangerous protrusions. The Installation work shall avoid pinch points, tripping hazards, snagging points, water traps, and areas that accumulate debris.
- 5.1.5 Waste matter, such as shavings, chips, loose hardware etc., shall be completely removed from all parts of the Vehicle.
- 5.1.6 Materials for the installation of the System Validation Equipment shall be in accord with the requirements of this Appendix 2.12 and all relevant Contract Standards, unless the SI obtains a written waiver from the MBTA. [CDRL: Request for waiver of materials requirement]
- 5.1.7 Unless specifically authorized by MBTA, the following materials shall not be used in the installation process:
 - 5.1.7.1 PVC;
 - 5.1.7.2 Asbestos;
 - 5.1.7.3 Urethane;
 - 5.1.7.4 Beryllium;
 - 5.1.7.5 Chlorinated fluorocarbons; and
 - 5.1.7.6 Materials that, in their installed state, emit products that are toxic or irritants.

If any of the above materials are discovered within a Vehicle, the SI must stop work immediately, and notify the MBTA per the requirements of Section 4.6 of this Appendix 2.12.

- 5.1.8 A list of all materials to be utilized in the installation of the System Validation Equipment shall be submitted to the MBTA and shall be subject to Design Review as described in Appendix 7. The SI shall keep a running list of all materials, including fixings, used in each type of Vehicle in table of matrix format (i.e. material name, material type and purpose, weight per Vehicle). The SI shall submit these tables along with any applicable material safety data sheet to the MBTA. [CDRL: Materials for System Validation Equipment installation preliminary design] [CDRL: Materials for System Validation Equipment installation final design] [CDRL: Materials tables]
 - 5.1.9 The SI shall keep available at each worksite a MSDS for all chemical materials (solvents, adhesives, caulking, etc.) used in the installation of the System Validation Equipment.
 - 5.1.10 The SI shall submit joining and fastening data, and specifications of all types and methods of fastening and joining used to the MBTA as part of the Vehicle Deployment, Installation, and Interface Plan. [CDRL: Joining and fastening data and specifications].
 - 5.1.11 Any material required to be removed by the SI for installation purposes (for example: panels) must be approved by the MBTA and properly re-installed to their original locations and in the same condition as when the material was removed, to the satisfaction of the MBTA.
 - 5.1.12 All materials added or replaced shall be new and of recent manufacture. Any material installed by the SI which is found to be defective or repaired, shall not be used and required to be replaced, unless specific approval is granted by the MBTA. Existing material which is found to be defective or repaired shall also not be put back in place unless specific approval is granted by a designated MBTA inspector.
 - 5.1.13 All replaced materials, or added components, shall be inherently corrosion resistant.
- 5.2 Storage of Material
- 5.2.1 The SI is responsible for secured storage and handling of all System Validation Equipment and all equipment used during Installation. MBTA Locations are space constrained and off-site storage may be required. Temporary storage may be available at some MBTA Locations, but will require prior approval from the MBTA in conjunction with Location coordination as described in Section 4.6 of this Appendix 2.12. All materials and equipment must be securely stored or removed from the Location upon the completion of an Installation work shift. No material or equipment may be left unattended for any duration of time.
 - 5.2.2 All components removed from a Vehicle during the Installation of the System Validation Equipment shall be stored in a manner that identifies from which Vehicle the materials have been removed and, from which location within such Vehicle the materials were removed. All components and materials shall be adequately protected to ensure that no damage or deterioration occurs during storage or their conveyance. Components and materials to be reinstalled should be stored in the immediate work area of the Vehicle.
 - 5.2.3 All dated material shall have the expiration date clearly marked. Expired material shall not be used.
 - 5.2.4 Rejected or damaged System Validation Equipment material shall be clearly marked, dispositioned, and stored separately from all other System Validation Equipment material.

The MBTA will work with the SI to designate a space at work areas for rejected or damaged material.

5.3 Fastening / Joining

- 5.3.1 Screws, rivets, mounting bolts, or similar items shall be replaced in kind. The use of exposed fasteners on the Vehicle interior shall be minimized. Interior fasteners shall be countersunk where possible, or low profile heads shall be used where countersinking is not possible. Interior fasteners shall not protrude as to become a tripping, snagging, or injurious hazard. The SI shall submit data sheet(s) of the type(s) of fasteners for use in the Vehicle for MBTA approval. [CDRL: Data sheet for fasteners]
- 5.3.2 Fastening to Structural Members
 - 5.3.2.1 Fastening to structural members shall be done only on the low stress portion of the structural member and shall not be located within 3/4" (17mm) from the open edge of the structural member.
 - 5.3.2.2 The SI shall ensure that any fastening or joining to structural members does not result in moisture accumulation within any structural member. To this end, fastenings to hollow, closed section structural members shall not be accomplished using drilled holes in the structural member.
- 5.3.3 Threaded Fasteners
 - 5.3.3.1 The number of different sizes and styles of fasteners used shall be minimized.
 - 5.3.3.2 Use of self-tapping or thread forming screws, threaded inserts or special or non-standard fasteners shall not be permitted without prior written MBTA approval.
 - 5.3.3.3 At least 1½ threads shall be visible beyond all nuts or fixing. Bolts shall not project out of any surface by more than ¼ inch (6 mm).
 - 5.3.3.4 In the Vehicle interior, all exposed fasteners shall be countersunk Torx with flat or oval heads.
- 5.3.4 Fastener Materials
 - 5.3.4.1 Fastener component materials (screws, nuts, washers, etc.) shall be properly selected for the application. All fasteners shall be stainless steel (Grade 316), unless otherwise approved.
 - 5.3.4.2 Anti-seize compounds shall be used on all stainless steel fasteners.
 - 5.3.4.3 Threaded aluminum fasteners shall only be used in tapped holes in solid aluminum structures.
- 5.3.5 Fastener Standards
 - 5.3.5.1 Threaded fasteners shall conform to current SAE J429 standards for externally threaded fasteners and SAE J995 standards for internally threaded fasteners. Steel fasteners ¼" diameter and above shall be SAE grade 5. Smaller non-structural screws may be SAE grade 2.
 - 5.3.5.2 Stainless steel fasteners shall be manufactured from austenitic stainless steel alloys, according to ASTM F 593, with a nominal tensile strength of 100 ksi. All fasteners shall be clean and free of manufacturing scale.
- 5.3.6 Locking Requirements
 - 5.3.6.1 All threaded fasteners shall be self-locking or provided with locking devices. Locking devices shall be normally lock washers, or prevailing torque type locknuts as appropriate for the application or service. All locknuts shall comply with the Industrial Fasteners Institute requirements regarding their locking ability
 - 5.3.6.2 Prevailing torque locknuts shall be of the nylon collar insert type. Previously used locknuts shall be discarded.
 - 5.3.6.3 When oversized or slotted holes are provided for installation tolerance allowance, flat washers, of suitable size to cover oversized holes, or slots shall be used in all

locations adjacent to the hole. In this case, at least one location hole shall be of close tolerance to ensure accurate positioning of component. If slotted holes are provided as a means of adjusting a piece of equipment, a secure method of fixing the adjustment shall be provided, such as adjustment screws, ribbed or toothed adjustment washers.

5.3.7 Stanchions

- 5.3.7.1 For the mounting of System Validation Equipment to stanchions, drilling holes and fastening may be required.
- 5.3.7.2 Holes may be drilled into stanchions for routing of wiring to System Validation Equipment and mounting to the stanchions. All holes created in stanchions shall be deburred. Holes that have wiring routed through them shall be protected with a rubber grommet or snap bushing and secured in place to prevent chafing of wiring.
- 5.3.7.3 All existing wiring in stanchions shall be protected before drilling holes, to avoid any damage (i.e. stop requests wiring).
- 5.3.7.4 Appropriate Loctite shall be used to seal and secure the bolts, nuts, studs, etc. from loosening due to vibration.
- 5.3.7.5 All debris created from holes must be removed from the vehicle.

5.4 Electrical

5.4.1 Wiring Requirements

- 5.4.1.1 Wire sizes and insulation shall be based on the required mechanical strength, temperature range and flexibility to suit the application. All conductors shall be copper. Contact surfaces shall be silver plated.
- 5.4.1.2 Minimum wire size for Vehicle wiring shall be 16 AWG for circuits with a working voltage less than 50V.
- 5.4.1.3 All wire and cable insulation shall meet the flame and smoke test requirements (set forth in Section 6), and shall be substantially free of halogens. The wire insulation selected shall be rated by the manufacturer to last greater than 30 years.
- 5.4.1.4 The MBTA shall approve all electrical wire used within the Vehicle prior to any Installation. The SI shall submit data sheet(s) of the type(s) of wire proposed for use in the Vehicle for MBTA approval. [CDRL: Data sheet for wire]
- 5.4.1.5 All conductors of multi-conductor cables shall be terminated with a connector.
- 5.4.1.6 Maximum current capacities shall conform to APTA PR-E-RP-009-98.
- 5.4.1.7 Any holes that must be created in Vehicles that extend into flooring or through Vehicle exterior will be sealed using wiring grommets.
 - 5.4.1.7.1 The SI's Proposal shall describe the approach and materials to be used for any holes in Vehicles. [PSR: Approach to Vehicle installation]

5.4.2 Wire and Cable Insulation

- 5.4.2.1 Wire insulation used for System Validation Equipment wiring shall preferably be crosslinked polyolefin or ETFE (Tefzel).
- 5.4.2.2 Insulation shall be 600V rated for circuits with a working voltage less than 50V, otherwise the insulation shall be rated for 2000V.
- 5.4.2.3 The insulation between the new wiring and Vehicle body shall be tested in accordance with IEC 61133 and IEC 60077-1 using a 500V megger before and after an appropriate Hi-Pot test. The megger readings shall be within 10% of each other and greater than 1MΩ.
- 5.4.2.4 Damaged wires and cables shall be replaced in kind.

5.4.3 Application and Installation

- 5.4.3.1 Wire shall be securely anchored to prevent chafing from relative motion.

- 5.4.3.2 Wiring shall be run in conduits, raceways or ducts and may be run through partitions with suitable protective bushings.
- 5.4.3.3 All wiring shall be performed and directed by experienced personnel using appropriate tools for stripping insulation, cutting, and attaching mechanical or hydraulic crimp-type terminals with correct dies.
- 5.4.3.4 All circuits shall be adequately protected and the Vehicle body and other structural components shall not be used for the return. All circuits and branches must be separable by a switch or terminal board to isolate their grounds when trouble-shooting is required.
- 5.4.3.5 All Vehicle wiring connected to a piece of electrical apparatus shall be insulated for the highest voltage supplied to that apparatus. Signaling, LVDC, AC, and HVDC wiring shall be run in different raceways or at least separated by greater than 1 inch (25mm).
- 5.4.3.6 Electrical circuits and associated cabling shall be designed with jump and creep distances between voltage potentials and car-body ground in accordance with IEC 60077 and the environmental conditions to which the components and wiring will be subjected.
- 5.4.3.7 Splicing and taping is prohibited.
- 5.4.3.8 The SI will not perform modifications to the ceiling or sidewall of the Vehicle unless approved by the MBTA prior to modification. In the event that the SI determines a modification to the ceiling or sidewall is required, it shall be presented to the MBTA for review.
 - 5.4.3.8.1 The SI's Proposal shall describe any modifications to the ceiling or sidewall of the Vehicle. [PSR: Approach to Vehicle installation]
- 5.4.4 Undercar and Roof Wiring Installation
 - 5.4.4.1 All wiring shall be run in metal conduits or ducts. They shall be of waterproof construction with entries and exits effectively sealed against water entry.
 - 5.4.4.2 Electric apparatus shall be housed in sealed enclosures to remain clean and dry.
 - 5.4.4.3 Through wiring shall not pass over or through the battery compartment or power resistors.
 - 5.4.4.4 Sufficient slack and wire length shall be provided to prevent breaking or pulling out of bushings or terminals, and to allow for a serviceability loop long enough for three re-terminations.
 - 5.4.4.5 Cable/wiring drip loops shall be provided where required, e.g. SI shall prevent the possibility of water running down external wiring and entering or pooling at an equipment connection area.
- 5.4.5 Cable Connectors
 - 5.4.5.1 Connectors are the preferred method of wire/cable termination
 - 5.4.5.2 Electrical items, which are singularly replaceable, shall be connected to Vehicle wiring through an individual connector.
 - 5.4.5.3 All external cable connectors shall comply with MIL-DTL-5015, be of watertight design, with removable / replaceable crimp contacts of the correct size for the wires being terminated. The cable jacket shall extend within the body and shall be held by a clamp.
 - 5.4.5.4 Unused connector pin positions shall be populated with either connector contacts or plastic sealing plugs designed for that purpose.
 - 5.4.5.5 Adjacent connectors shall be polarized prevent erroneous connections.
- 5.4.6 Terminals
 - 5.4.6.1 Terminal types shall be limited and specifically identified in the Proposal. [PSR: Approach to Vehicle installation]

- 5.4.6.2 Wire end terminals shall be attached to the wiring only with the crimping tools and dies recommended by the connector manufacturer. The crimp terminal shall be rated to match the wire conductor diameter and the insulation diameter. For wire AWG 10 and smaller crimp terminals shall securely grip and hold the insulation
- 5.4.6.3 Strain relief shall be provided to minimize stress and vibration at the termination point.
- 5.4.7 Conduit and Raceway Requirements
 - 5.4.7.1 All electrical conduits and raceways shall not corrode, and shall be free of burrs, and sharp or square edges. Fixings to the Vehicle shall not be penetrated the conduit or raceway.
 - 5.4.7.2 Wires and cables installed in flexing applications shall be housed in abrasion resistant, flexible conduit designed for the application, and installed such that there is no pinching, stretching, or kinking under all ranges of motion.
 - 5.4.7.3 All conduits shall be arranged to prevent moisture traps and shall drain toward control boxes, and shall be supported at least every 24 inches (600mm).
 - 5.4.7.4 Wires in conduits, ducts, and raceways shall be free of kinks, abrasions, and insulation skinning.
 - 5.4.7.5 If a conduit is designed to come through the flooring of the Vehicle and into equipment boxes located at the passenger compartment level, the conduit must extend 2 inches above floor level to prevent water or cleaning chemicals from draining onto the below-floor cables.
- 5.4.8 Cleating
 - 5.4.8.1 Split block cleats of glass fiber reinforced molded plastic or an approved equivalent shall cleat all cable and wiring not installed in conduits, on cable racks or raceways.
 - 5.4.8.2 The holes in the cleat shall be sized for the individual wires and cables. The edge of the hole shall be smooth to prevent square edge contact with cable insulation.
 - 5.4.8.3 Each cleat shall have a stiffener on the side away from the mounting bracket that will act to spread the bolt clamping force over the entire length of the cleat.
 - 5.4.8.4 Cable and wiring using cleating shall be supported to the Vehicle at least every 18 inches (450mm).
- 5.4.9 Equipment Enclosures, Junction Boxes, and Fittings
 - 5.4.9.1 Boxes, covers, and fittings shall be stainless steel. The interiors of all electrical equipment enclosures shall be white. All box covers shall be marked with the contents and all like covers shall be interchangeable. The box covers shall be held in place with latches.
 - 5.4.9.2 All undercar and roof-mounted junction and pull boxes shall be NEMA “4X” enclosures, and shall protect any enclosed equipment and connected conduits from water seepage.
- 5.4.10 Wire Identification and Terminal Markings
 - 5.4.10.1 Wire numbers shall be assigned to all wires or cables.
 - 5.4.10.2 All wires and cable shall be marked within 12 inches (300 mm) of the end of the wire.
 - 5.4.10.3 System Validation Equipment wiring shall emulate the numbering system presently employed on the Vehicle and add a prefix “FV”.
- 5.4.11 Circuit Protection
 - 5.4.11.1 Circuit protection shall prevent damage to its associated Vehicle wiring.
 - 5.4.11.2 Fuses shall not be deployed without prior written MBTA approval.

- 5.4.11.3 Circuit breakers/fuses shall be properly coordinated such that an electrical fault causes the minimum of disruption to the Vehicle.
- 5.4.11.4 Circuit breakers shall be molded-case type, single- or multi-pole, with frame size suitable for continuous current and interrupting duty. The handle shall unambiguously indicate ON, OFF, and TRIPPED positions.
- 5.4.11.5 Each pole shall be equipped with a trip mechanism consisting of an inverse time element for overload protection and an element for short circuit protection.
- 5.4.11.6 Multi-pole breakers shall operate contacts simultaneously.
- 5.4.11.7 Breaker current rating shall be clearly visible after installation.
- 5.4.12 Grounding
 - 5.4.12.1 The SI shall ensure that all metal parts that support the System Validation Equipment or its power supply wiring, which could be touched by passengers, or MBTA personnel, shall be grounded. This shall apply to the stanchions.
 - 5.4.12.2 Ground bonding connections shall be made through specific grounding pads silver soldered to the car-body, either stainless steel, or tinned copper pads.
 - 5.4.12.3 Low voltage and high voltage circuits shall not be grounded to the same grounding pad.
 - 5.4.12.4 All ground pads shall be visible and accessible for inspection and troubleshooting. The ground connections shall be attached by an appropriate bolt, washers, lock-washer and nut.
 - 5.4.12.5 All removed equipment enclosure and shock-mounted equipment ground straps shall be replaced. Note that resiliently-mounted equipment use flexible strap-type grounding leads with a length sufficient to prevent failure from fatigue.
 - 5.4.12.6 In no case shall the size of a ground cable or shunt be less than No. 10 AWG.
- 5.5 Integration of Other Vehicle Electrical Systems
 - 5.5.1 In the event that the SI determines modifications are required to other Vehicle electrical systems (i.e. multiplexing systems, on-board vehicle monitoring systems), costs associated with such modifications will be the responsibility of the SI.
 - 5.5.1.1 The SI shall identify all modifications to Vehicle electrical systems and submit all proposed/required modifications for the MBTA's approval. [PSR: Approach to Vehicle installation]
 - 5.5.2 Multiplexing system modifications may be required on buses in order to appropriately power System Validation Equipment. The MBTA and SI shall, determine the best approach to review, approve, and upload all required modifications to multiplexing systems for each bus type upon review of the SI installation plan.
 - 5.5.2.1 The SI shall include its recommended approach to modifications to multiplexing systems in the Proposal. [PSR: Approach to Vehicle installation]

6. Flammability, Smoke Emission and Toxicity

The System Validation Equipment shall comply with low flammability, low halogen, low smoke emission, no toxic gas, and fire retardation requirements.

6.1 Flammability and Smoke Emission

- 6.1.1 As a minimum, all materials used in the construction of the Vehicle shall meet the requirements of the 49 CFR Appendix B to Part 238-Test Methods and Performance Criteria for the Flammability and Smoke Emission Characteristics of Materials Used in Passenger Cars and Locomotive Cabs.

- 6.1.2 All materials and construction shall meet the requirements of NFPA 130. Should a conflict exist between the NFPA and the Contract Standards the more restrictive provisions shall govern.
- 6.1.3 The SI shall furnish a list of materials (flammability matrix) added to the Vehicles detailing the locations of the material, total weight per Vehicle, specific heat, flame spread, flashpoint, smoke generation, and toxicity. [CDRL: Flammability matrix]
- 6.1.4 The SI shall submit laboratory test results for each test required under this Section 6.1, including a technical data sheet, for approval. Test report Documentation shall specifically identify the tested material by the same description that appears on the technical data sheet. [CDRL: Materials test report] [CDRL: Materials technical data sheet]
- 6.1.5 Copies of prior test results showing that proposed materials have been recently tested and all materials comply with all of the standards set forth in this Section 6.1 shall be submitted prior to use and installation. [CDRL: Test waiver requests]
- 6.1.6 Verification must be delivered to the MBTA prior to the material's use and installation that the material presently being considered for use is the same composition as that previously tested. [CDRL: Test certificates]

Table 2: Flammability and smoke emission criteria

| Material function | Test procedure | Performance criteria |
|--|---|---|
| Fare Validation box complete | ASTM E 162 ASTM E 662 | Is = 35 Ds (1.5) = 100 Ds (4.0) = 165 |
| Wire Insulation (1, 2, 19) | IEEE Std 383 - Flammability ASTM E 662 | Pass Ds (4.0) = 50 |
| Where: | | |
| 1. Is = Ignition time in seconds for a flammable material | | |
| 2. Ds = Smoke Density in Seconds usually done with ASTM E 662 test | | |

- 6.2 Toxicity
- 6.2.1 Materials and products recognized to have highly toxic products of combustion shall not be used.
- 6.2.2 All materials used in the car construction, except for materials that in total contribute to less than 1.1lb (0.5kg) of the Vehicle tare weight, and would not contribute significantly to fire propagation or to smoke or toxic gas generation, shall be tested for toxicity using Boeing Specification Support Standard BSS-7239. Materials shall meet the following maximum toxic gas release limits (ppm) as determined per BSS-7239.

Table 3: Toxic gas release limits

| Gas | Maximum concentration |
|----------------------|------------------------------|
| Carbon Monoxide (CO) | 3500 ppm |

| | |
|-----------------------------------|---------|
| Hydrogen Fluoride (HF) | 200 ppm |
| Nitrous Oxide (NO ₂) | 100 ppm |
| Hydrogen Chloride (HCL) | 500 ppm |
| Hydrogen Cyanide (HCN) | 150 ppm |
| Sulfur Dioxide (SO ₂) | 100 ppm |

6.2.3 The tests are to be run in the flaming mode after 240 seconds using the NBS Smoke Density Chamber for sample combustion. The gas sampling may be conducted during the smoke density test. The test report shall indicate the maximum concentration (PPM) for each of the above gases. [CDRL: Test results for toxic gas release limits]

7. Removal of Existing System Fareboxes

The SI shall remove all farebox system components from all Vehicles.

7.1 Timing

7.1.1 The timeline for farebox system components removals shall be identified by the SI in the Project Management Plan described in Appendix 2.11. An updated version of the timeline for farebox removals shall be provided prior to the Revenue Service Commencement Date. [CDRL: Timeline for farebox removals]

7.1.1.1 The Proposal shall include a preliminary timeline for farebox removal as part of the preliminary Project Management Plan Submittal required by Appendix 2.11. [PSR: Preliminary Project Management Plan]

7.1.2 All fareboxes shall be removed within ninety (90) days following the Full Service Commencement Date.

7.1.3 No fareboxes can be removed by the SI prior to the Transition Period Completion unless authorized by MBTA in writing.

7.1.4 The SI shall notify the MBTA in writing when farebox removals have been completed. [CDRL: Notification of farebox removal completion]

7.2 Farebox Removal

7.2.1 The SI shall provide a farebox removal plan for MBTA review which describes how the SI will address all of the requirements in this Section 7. The farebox removal plan shall be subject to Design Review as described in Appendix 7. [CDRL: Farebox removal plan conceptual design] [CDRL: Farebox removal plan preliminary design] [CDRL: Farebox removal plan final design]

7.2.2 The farebox system components have been implemented across multiple Vehicle types and models spanning buses and Light Rail Vehicles. Installation methods, base platforms, etc. differ per Vehicle type. The SI farebox removal plan solution shall address all MBTA requirements for the removal across all Vehicle fleets.

7.2.3 For purposes of this Section 7, the farebox system components for SI removal, packaging, and storage shall include fareboxes on Vehicles, including driver control units (DCUs) or operator control units.

7.2.4 MBTA will instruct the SI as to the final disposition of any removed farebox system components as described in Appendix 4.6. Until the final disposition, SI will exercise

extreme care to ensure the farebox components are removed and packaged in secure and delicate manner to ensure their integrity and longevity.

- 7.2.5 Upon removing fareboxes, the SI shall implement a solution, to cover and seal cavities and holes left by a removed farebox, e.g. install plugs and/or plates to cover all holes in the floor, pedestal, etc. beneath the fareboxes including the mounting holes and power and communication cable(s) access hole(s). The SI's "plug-cover" solutions and designs shall be described in the farebox removal plan and shall:

7.2.5.1 Be flush to the Vehicle floor / floor covering / pedestal / pedestal covering.

7.2.5.2 Be weatherproof to combat exterior and interior environmental elements.

7.2.5.3 (For Cover Plates): Have beveled edges.

7.2.5.4 (For Cover Plate): Have sufficient strength not to bend, crack, or break if stepped on by a 325 pound person.

7.2.5.5 Include anti-corrosive coating.

7.2.5.6 Meet ADA wheelchair accessibility requirements associated with potential wheel impediments.

7.2.5.7 Not cause tripping hazards.

7.2.5.8 Address all cavities, holes, and mounting plates

- 7.2.6 The SI shall remove the data storage memory card from the farebox and securely and irretrievably destroy it in a manner consistent with the requirements in Appendix 3.1, specifically and without limitation, data destruction.

- 7.2.7 Farebox Cabinet Removal Considerations

Some MBTA farebox cabinet installations may have included farebox floor reinforcement plates, which served as a large washer(s) and floor "strengthener" or stabilizer to combat farebox movements due to road vibration, sway, and customer stabilizing grab points.

Some of these plates may not be easily removed (e.g. some may have become embedded and/or were epoxied underneath the floor.) In certain locations, some plates reinforce the strength and integrity of the Vehicles' floor beneath the farebox, and will continue to do so post-farebox removals. As a result, the SI must, at a minimum, determine whether the reinforcement plates serve to reinforce the strength and integrity of a floor, or, if removed, would create a hazard or affect the structural integrity of the floor.

- 7.3 Farebox Power and Communication Harnesses and Cables

MBTA requires that the power and communications cables remain on the Vehicles, including the circuit breakers (CBs). The Farebox CB will remain in place. SI shall disconnect the farebox power cable from the Vehicle power panel and CB. The SI shall disconnect, cover and protect, coil (when and where possible), and tie-down the cables at both ends; at the power panel and communication source sides and the farebox side. SI shall also label the farebox cables (as described in Section 5.4.10.3) at their source and destination (if not done so already).

- 7.4 Farebox System Packaging and Storage

- 7.4.1 The SI shall package the farebox system components and ship them to an SI-managed central location. The farebox system components shall be securely stored in an

environment consistent with the documented Scheidt & Bachmann farebox storage environmental limits (see the Reference Documents).

- 7.4.2 The SI shall store the farebox system components as described in Appendix 4.6.
- 7.4.3 The following requirements shall apply to the farebox system components packing and storage obligations of the SI:
 - 7.4.3.1 All farebox system component serial / ID numbers and quantities shall be recorded by the SI. (Serial numbers of fareboxes shall be recorded, but not S/Ns of internal farebox modules.)
 - 7.4.3.2 DCUs shall be removed and packaged separately from fareboxes.
 - 7.4.3.3 All farebox system components shall be packaged on wooden pallets and securely banded / wrapped to ensure safe shipment.
 - 7.4.3.4 Computer systems shall be packed into boxes using suitable cushioning.
 - 7.4.3.5 All miscellaneous components (cables, probes, connectors, etc.) shall be clearly labeled with their description and location before being packed into boxes.
 - 7.4.3.6 The MBTA will provide no storage for farebox system components. All components must be removed from MBTA property in accordance with the above requirements.

8. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.12. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.3, 2.4, 2.8, 2.13, 2.14, 2.16 and 5. [PSR: Proposer team experience: Implementation, expansion, DB oversight and testing]

APPENDIX 2.13

PLANS AND SPECIFICATIONS FOR DB INSTALLATION WORK

The SI shall develop plans and specifications for the performance of the DB Installation Work, including a description of the overall scope of the DB Installation Work based on the SI's System design decisions, equipment layout plans specific to each Location (excluding Retail Reload Locations), Installation requirements specific to each Device (excluding Installation on Vehicles), any performance testing and acceptance standards for the DB Installation Work and all other information required to be provided by the SI pursuant to this Appendix 2.13 (the "DB Plans and Specifications"). The DB Plans and Specifications shall comply with the requirements of this Appendix 2.13 and shall define the construction, reconstruction, physical alteration, remodeling, wiring and electrical services required in respect of the Installation of System Elements at Locations (excluding Retail Reload Locations). The DB Plans and Specifications shall not include requirements in respect of the Installation of System Elements on Vehicles or at Retail Reload Locations or SI Locations. The DB Plans and Specifications must adhere to all Contract Standards.

The DB Plans and Specifications shall be delivered in two phases: the Preliminary DB Plans and Specifications shall be submitted with the Proposal, and the Complete DB Plans and Specifications shall be developed and finalized following the Date of Award in accordance with this Appendix 2.13.

The SI shall be solely responsible for the performance capability of all System Elements and shall not include any requirements in the DB Plans and Specifications that would serve to transfer the risk of the performance capability of any System Element to the MBTA or the DB Entity. The DB Plans and Specifications shall be prepared in accordance with the Contract Standards and shall seek to facilitate transit system throughput, minimize queuing, and avoid disruption to Revenue Service.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.13 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Plans and Specifications for DB Installation Work general approach]

1. Preliminary DB Plans and Specifications

The Proposal must include each of the PSRs set forth in this Section 1. These PSRs collectively will form the Preliminary DB Plans and Specifications, which will be further developed by the SI after the Date of Award to establish the Complete DB Plans and Specifications in accordance with Section 2, and, as such, must align with the requirements for the Complete DB Plans and Specifications and be consistent with all requirements of this Appendix 2.13.

The Preliminary DB Plans and Specifications will be evaluated based on:

- The extent to which the DB Plans and Specifications:
 - Adequately define the scope of the DB Installation Work; and
 - Form a credible, achievable and effective basis for the performance of the DB Installation Work in accordance with the requirements of this Project Agreement; and

- The estimated cost impact to the MBTA in providing for the performance of the DB Installation Work based on the MBTA's independent estimate of the cost impact associated with various potential approaches to the DB Installation Work.

1.1 Device Lists and Quantities

| ID | Description | Rationale | PSR |
|-----------|---|---|-------------------------------------|
| 1.1.1 | A preliminary list of all Devices that the SI will provide to the DB Entity to meet the Quantity Standards, including all Device Types, Variants, quantities, and Locations | The Device list will help inform the MBTA's estimate of cost impact | Device quantities; POS Locations |
| 1.1.2 | Specifications for all Devices, including size, weight, power source, communications connections, and mounting equipment necessary for each Device | The specifications will help inform the MBTA's estimate of cost impact | Device specifications (preliminary) |
| 1.1.3 | A description of calculations made to determine quantities | To evaluate credibility of the Device list and overall DB Plans and Specifications. | Quantity calculation description |

1.2 Phase-In Plan

| ID | Description | Rationale | PSR |
|-----------|--|---|-----------------------------|
| 1.2.1 | A preliminary phase-in plan that indicates proposed DB Completion Dates, operational dates of System Elements, Station construction activities, phase-in of the new equipment, phase-out of AFC 1.0 Equipment (including removal of all AFC 1.0 FVMs), and staging in each Station during each Defined Phase | The phase-in plan will inform both credibility and estimated cost impact | Phase-in plan (preliminary) |
| 1.2.2 | The plan shall identify each Defined Phase, including a general description of the DB Installation Work required in respect of each Key Milestone | Will inform both credibility and estimated cost impact | |
| 1.2.3 | The plan shall explain the selected Gate Option(s) in a manner consistent with the Contract Standards, including compliance with Egress Standards and Accessibility standards throughout Installation and at each Key Milestone | Will inform both credibility and estimated cost impact | |
| 1.2.4 | The plan shall explain the Proposer's assumptions for how many times the DB Entity will need to mobilize and de-mobilize at each Location | The magnitude of contractor mobilization and movement will have an impact on the cost of the DB Installation Work | |

1.3 General Approach

A description of how the DB Installation Work must be performed to execute the DB Plans and Specifications, including:

| ID | Description | Rationale | PSR |
|-----------|--|--|---|
| 1.3.1 | Summary of survey and field work that must be completed prior to final design or construction, including code reviews and analysis | Will inform both credibility and estimated cost impact | Survey and field work needs (preliminary) |
| 1.3.2 | List of key permits that the DB Entity would be expected to obtain | The design solution interaction with key regulations will have an impact on estimated cost | Program permit list (preliminary) |
| 1.3.3 | Work in the DB Plans and Specifications that will require right-of-way protection (flagging) or police details at all Locations | The design solution interaction with key regulations will have an impact on estimated cost | Installation site rules and regulations (preliminary) |
| 1.3.4 | Any limitations or rules on the timing of installing Devices by the DB Entity to allow for overall project coordination to follow regulations on customer interference and access | The extent to which the proposal represents the MBTA's requirements and additional SI requirements will be evaluated, including avoiding peak hours, maintaining adequate Gates during all service hours, disallowing closures during revenue collection hours, and special considerations based on Location | |
| 1.3.5 | The training to be provided to the DB Entity on handling, use and installation of the System Elements | Will inform both credibility and estimated cost impact | DB Entity training program summary |
| 1.3.6 | A list of expected key submittals from the DB Entity for review by the SI, including design submittals, progress submittals and submittals in respect of the completion of each Defined Phase | To allow the MBTA and SI to adequately monitor, review, accept, and track the progress of design development and the progress of the DB Installation Work | DB Entity project management guide (preliminary) |
| 1.3.7 | A general description of the requirements for the achievement of substantial completion of each Defined Phase, including a general description of testing that will be required to verify substantial completion and punch list items that may remain following substantial completion | Will inform both credibility and estimated cost impact | |
| 1.3.8 | Identification of inspections the SI will undertake to monitor the performance of the | Will inform both credibility and estimated cost impact | |

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| | DB Installation Work and determine substantial completion of each Defined Phase. | | |
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1.4 Technical Approach

A general description/narrative addressing the following technical topics:

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>PSR</i> |
|-----------|---|---|---|
| 1.4.1 | The impact of installing new Customer-Facing Devices on immediate surrounding areas within a Location, including potential changes needed to flooring/ground, walls, adjacent equipment and overall layout. | Changes to areas around Devices will have an impact on estimated cost | Summary of technical approach to DB Installation Work |
| 1.4.2 | What ancillary facilities within a Location need to be removed, replaced or relocated to accommodate new Devices. Ancillary facilities could include benches, lighting, signage, barriers, or other Location amenities. | Changes to areas around Devices will have an impact on estimated cost | |
| 1.4.3 | The approximate percentage of Location work that will be done in public areas of Locations compared to non-public areas. | Access to non-public areas of Stations may have schedule and cost impacts | |
| 1.4.4 | A preliminary list of surveys, drawings, data and tools the SI will create or rely upon to develop the Complete DB Plans and Specifications | Will inform both credibility and estimated cost impact | |
| 1.4.5 | A description of the installation templates for each of the items of System Elements to be provided in respect of the DB Installation Work | Will inform both credibility and estimated cost impact | |
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1.5 Interface Plan

A preliminary interface plan which describes the integration of the DB Installation Work and the SI's implementation work, to include the following:

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>PSR</i> |
|-----------|---|--|------------------------------|
| 1.5.1 | Plans for supplying System Elements for the performance of the DB Installation Work | Will inform both credibility and estimated cost impact | Interface plan (preliminary) |
| 1.5.2 | Schedule and plan for making System Elements available in a timely manner | Will inform both credibility and estimated cost impact | |

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| 1.5.3 | The expected means of coordination with the MBTA and the DB Entity, including coordination regarding the SI's receipt and storage of removed AFC 1.0 Equipment | Will inform both credibility and estimated cost impact | |
| 1.5.4 | Information on the SI's Personnel assigned to the installation, their duties and the on-site project manager for the SI during DB Installation Work | Will inform both credibility and estimated cost impact | |
| 1.5.5 | The interfaces with other contractors, consultants, and projects (including Planned Expansions) shall be identified, including the expected information exchange needed among separate contractors | Will inform both credibility and estimated cost impact | |
| 1.5.6 | A description of the procedures to be followed for the implementation of changes to hardware and software during the performance of the DB Installation Work and the coordination of handoff to the SI for commissioning and performance testing upon the achievement of substantial completion of each Defined Phase | Will inform both credibility and estimated cost impact | |
| 1.5.7 | A list of the specialized equipment and structures that must be procured or fabricated in order complete the DB Installation Work. The list must note to what extent the SI will provide the specialized equipment and structures as opposed to requiring the DB Entity to source materials. | Source of necessary materials will inform cost impact. | |

1.6 Gates

A general description/narrative addressing the following topics related to the installation and rehabilitation of gates:

| ID | Description | Rationale | PSR |
|-----------|--|--|---|
| 1.6.1 | The Gate Option(s) chosen by the SI, and the associated requirements for the DB Installation Work | Will inform both credibility and estimated cost impact | Gate installation details (preliminary) |
| 1.6.2 | How the footprint of Gate Arrays will align with the current Array footprints (both for final and any interim/transition conditions) | Gate Arrays that do not change from the current footprint will have lower cost impacts | |
| 1.6.3 | What connections must be made to each Gate, including power and communications, and the type and manner of conduit and ductwork required to make such connections. The specific power draw and | Connections to Gates that do not exceed current requirements will have lower costs impacts | |

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| | communications connection type must be described | | |
| 1.6.4 | The length of the Gate aisle in comparison to existing AFC 1.0 Gates | Will inform both credibility and estimated cost impact | |
| 1.6.5 | The approach for mounting and securing Gates in a typical MBTA Station | Will inform both credibility and estimated cost impact | |

1.7 Station Validators

A general description/narrative addressing the following topics related to the installation of Station Validators:

| ID | Description | Rationale | PSR |
|-----------|--|---|--|
| 1.7.1 | What connections must be made to each Validator, including power and communications, and the type and manner of conduit and ductwork required to make such connections. The specific power draw and communications connection type must be described | Connections to Validators that do not exceed current available power and communications will have lower costs impacts | Station Validator installation details (preliminary) |
| 1.7.2 | The approach for mounting and securing Validators in a typical MBTA Station | Will inform both credibility and estimated cost impact | |

1.8 Fare Vending Machines

A general description/narrative addressing the following topics related to the installation of Fare Vending Machines:

| ID | Description | Rationale | PSR |
|-----------|---|---|---|
| 1.8.1 | How the footprint of FVMs will align with the current AFC 1.0 FVM footprints (both for final and any interim/transition conditions) where applicable | FVMs that do not change from the current footprint will have lower cost impacts | Fare Vending Machine installation details (preliminary) |
| 1.8.2 | What connections must be made to each Variant of FVM, including power and communications, and the type and manner of conduit and ductwork required to make such connections. The specific power draw and communications connection type must be described | Connections to FVMs that do not exceed current available power and communications will have lower costs impacts | |
| 1.8.3 | The approach for mounting and securing FVMs in a typical Location, including differences by Locations and environments | Will inform both credibility and estimated cost impact | |
| 1.8.4 | The approach for having AFC 1.0 FVMs and new FVMs installed alongside each other during Installation | Will inform both credibility and estimated cost impact | |

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| 1.8.5 | Differences in any of the above by FVM Variant | Will inform both credibility and estimated cost impact | |
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1.9 CN Equipment

A general description/narrative addressing the use of the Communications Network, including:

| <i>ID</i> | <i>Description</i> | <i>Rationale</i> | <i>PSR</i> |
|-----------|---|--|---|
| 1.9.1 | A description of all new CN Equipment to be installed in Locations to support communications to Devices | New CN Equipment may have cost impacts | CN Equipment installation details (preliminary) |
| 1.9.2 | A description of the extent of the use of MBTA Layer 2 Services | Will inform both credibility and estimated cost impact | Use of MBTA Layer 2 Services |

2. Complete DB Plans and Specifications

The SI shall develop the Complete DB Plans and Specifications per the requirements listed below. The Complete DB Plans and Specifications must expand upon and further develop the Preliminary DB Plans and Specifications, while maintaining consistency with the Preliminary DB Plans and Specifications.

The SI shall develop the Complete DB Plans and Specifications in accordance with all Contract Standards and to a level of design development sufficient to define the scope of the DB Installation Work and enable the MBTA to procure a fixed-price DB Contract for the performance of the DB Installation Work.

[CDRL: Complete DB Plans and Specifications]

2.1 Device Lists and Quantities

| <i>ID</i> | <i>Description</i> | <i>Supplemental Requirements</i> | <i>CDRL</i> |
|-----------|--|----------------------------------|--|
| 2.1.1 | The final list of all Devices that the SI will provide for the performance of the DB Installation Work to meet the Quantity Standards, including all Device types, Variants, quantities, and Locations | | Final Device quantities; Final Device layouts |
| 2.1.2 | Specifications for all Devices, including size, weight, power source, communications connections, and mounting equipment necessary for each Device | | Device specifications (final) |
| 2.1.3 | A description of calculations made to determine quantities | | Quantity calculation description |

2.2 Phase-In Plan

| ID | Description | Supplemental Requirements | CDRL |
|-----------|---|--|-----------------------|
| 2.2.1 | Final phase-in plan that indicates DB Completion Dates, operational dates of the System Elements, Location construction activities, phase-in of the System Elements, phase-out of AFC 1.0 Equipment (including removal of all AFC 1.0 FVMs), and staging in each Location during each Defined Phase | Primavera Schedule with Activity IDs, durations, predecessors for each Location work activity Specification of the number of gates accepting AFC 1.0 Media and System Media, Accessibility compliant, and out of service at each stage of Installation | Phase-in plan (final) |
| 2.2.2 | The plan shall identify each Defined Phase, including identification of all DB Installation Work required in respect of each Key Milestone | | |
| 2.2.3 | The plan shall explain the selected Gate Option(s) in a manner consistent with the Contract Standards, including compliance with Egress Standards and Accessibility standards throughout Installation and at each Key Milestone | For Egress Standards, the plan shall account for sufficient equipment available at every Location on a continuous basis to allow access to the System for the anticipated patron flows and in accordance with the Quantity Standards (Appendix 2.10) For Accessibility standards, access for all patrons must be maintained at all times, including necessary provisions of Accessible Gates, accessible AFC 1.0 Gates and FVMs to ensure an ability to utilize the Transportation Network by all patrons | |
| 2.2.4 | The plan shall explain the SI's assumptions for how many times the DB Entity will need to mobilize and de-mobilize at each Location | | |

2.3 General Approach

A description of how the DB Installation Work must be performed, including:

| ID | Description | Supplemental Requirements | CDRL |
|-----------|---|---|---|
| 2.3.1 | Identify survey and field work that must be completed prior to final design or construction, including code reviews and analysis | | Survey and field work needs (final) |
| 2.3.2 | Identify all expected DB Governmental Approvals | Identify all permits to be obtained by the DB Entity by Location. | Program permit list (final) |
| 2.3.3 | Work in the DB Plans and Specifications that will require right-of-way protection (flagging) or police details at all Locations | | Installation site rules and regulations (final) |
| 2.3.4 | Any limitations or rules on the timing of installing devices by the DB Entity to allow for overall project coordination to follow regulations on customer interference and access | | |
| 2.3.5 | The training to be provided to the DB Entity on handling, use and installation of the System Elements | | DB Entity training program |
| 2.3.6 | A list of all submittals required in connection with the performance of the DB Installation Work for review by the SI, including all design submittals, progress submittals and submittals in respect of the completion of each Defined Phase | | DB Entity project management guide (final) |
| 2.3.7 | The requirements for the achievement of substantial completion of each Defined Phase and identification of acceptable punch list items that may remain following substantial completion | | |
| 2.3.8 | Identification of all inspections the SI will undertake to monitor the performance of the DB Installation Work and determine substantial completion of each Defined Phase. | | |
| 2.3.9 | Any project management techniques required in respect of the performance of the DB Installation Work, including the frequency of meetings with the SI. | | |

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| 2.3.10 | The testing regime for each element of the DB Plans and Specifications | Acceptance testing requirements per each Device and System Element Testing documents shall include: description of test procedures, expected test duration, test check list and testing sign off sheet. | DB Installation Work testing regime (final) |
|--------|--|--|---|

2.4 Technical Approach

| ID | Description | Supplemental Requirements | CDRL |
|-----------|--|---|---|
| 2.4.1 | Requirements addressing the impact of installing new Customer-Facing Devices on immediate surrounding areas within a Location, including changes needed to flooring/ground, walls, adjacent equipment and overall layout | Identify alterations, improvements, repairs to areas on or around Devices | DB Installation Work technical approach |
| 2.4.2 | What ancillary facilities within a Location need to be removed, replaced or relocated to accommodate new Devices. Ancillary facilities could include benches, lighting, signage, barriers, or other Location amenities | Identify alterations, improvements, repairs to areas on or around Devices | |
| 2.4.3 | Identification of Location work that will be done in public areas of Locations and Location work that will be done non-public areas | | |
| 2.4.4 | The surveys, drawings, data and tools the SI has created or relied upon to develop the Complete DB Plans and Specifications | | |
| 2.4.5 | Installation templates for each System Element to be provided in respect of the DB Installation Work | | |

2.5 Interface Plan

An interface plan which describes the integration of the DB Installation Work and the SI's implementation work, to include the following:

| ID | Description | Supplemental Requirements | CDRL |
|-----------|---|---|------------------------|
| 2.5.1 | Detailed plan for supplying System Elements necessary for the performance of the DB Installation Work | Location of equipment storage or means of delivery to account for product delivery timelines to plan installation schedules | Interface plan (final) |
| 2.5.2 | Detailed schedule and plan for making System Elements available for the | Primavera Schedule with Activity IDs, durations, of equipment availability; | |

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|-------|---|--|--|
| | performance of the DB Installation Work in a timely manner | coordination with Project Schedule | |
| 2.5.3 | Requirements for coordination among the SI, the MBTA and DB Entity, including coordination in respect of the SI's receipt and storage of removed AFC 1.0 Equipment | | |
| 2.5.4 | Information on the SI's personnel assigned to the installation, their duties and the on-site project manager for the SI during the performance of the DB Installation Work | An adequate staffing plan from the SI to perform its obligations in respect of the monitoring of the DB Installation Work | |
| 2.5.5 | The interfaces with other contractors, consultants, and projects (including Planned Expansions) shall be identified, including the expected information exchange needed among separate contractors | | |
| 2.5.6 | Procedures to be followed for the implementation of changes to hardware and software during the performance of the DB Installation Work and the coordination of handoff to the SI for commissioning and performance testing upon the achievement of substantial completion of a Defined Phase | These procedures shall be general step by step procedures which can be applied to the implementation of any new item of equipment or new feature and shall incorporate the use of the Model Office (described in Appendix 2.4) | |
| 2.5.7 | Complete list of the specialized equipment and structures that must be procured or fabricated in order complete the DB Installation Work, and sources of such materials. | | |
| 2.5.8 | Definition of roles and responsibilities between the SI and the MBTA/DB Entity related to connecting, testing and commissioning the equipment | Definition of roles must be consistent with this Project Agreement and will not serve to relieve the SI of the SI's obligations under this Project Agreement | |

2.6 Detailed Plans by Device and Location

| ID | Description | Supplemental Requirements | CDRL |
|-----------|--|----------------------------------|-------------------------|
| 2.6.1 | Final quantities for all Devices to be installed through the DB Plans and Specifications, and meeting the Quantity Standards required in Appendix 2.10 | | Final Device quantities |

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|-------|---|--|----------------------|
| 2.6.2 | Layout plans for each and every Location included in the DB Plans and Specifications, showing location of all System Elements | <p>Design level of accuracy/detail:</p> <p>a. <u>Rapid Transit Station</u> Scale Drawings: 40' Gate Arrays: 6" Fare Vending Machines: 5' Validators: 5'</p> <p>b. <u>Commuter Rail Station</u> Scale Drawings: 100' Fare Vending Machines: 20' Station Validators: 20'</p> <p>c. <u>Other Locations</u> Scale Drawings: 100' Fare Vending Machines: 10'</p> <p>d. <u>All Other System Elements</u>: 10'</p> <p>Electrical one-line diagram depicting the power scheme for each Location</p> <p>Communications requirements for each Location. Identified by use of existing MBTA CN service or proposed other service (wired or wireless)</p> <p>Communications Network one-line diagram for each Location. One overall system communications one-line diagram.</p> <p>Any site modifications anticipated to support System Elements at each Location, including: floor repairs, device foundation, floor leveling, demolition, removal of AFC 1.0 Equipment</p> | Final Device layouts |
| 2.6.3 | List of requested access rights pursuant to Section 5.11 of the Project Agreement in respect of the performance of the DB Installation Work | Right of way plans showing each needed acquisition or easement, excluding laydown or staging areas | Access rights detail |

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| 2.6.4 | Typical installation diagrams for each Device Type and each existing condition | Typical installation detail of each Device installation at each existing condition (i.e. indoor, outdoor, pole mount, foundation, bituminous, concrete, etc.) | Typical installation diagrams |
| 2.6.5 | Detailed Device installation plans and specifications for all System Elements and Devices, including all Variants | <p>Detailed Installation plans and specifications for Gates (including each Defined Phase), Station Validators, Fare Vending Machines and CN Equipment. All plans and specifications must align with the Preliminary DB Plans and Specifications</p> <p>Any special instructions, and foundation instructions for Devices. Gate details shall properly identify installation of gates over existing or new walker duct.</p> <p>Electrical load requirements for each Device and include any additional electrical design considerations required for Device to properly function.</p> | Device installation plans and specifications |

2.7 The Complete DB Plans and Specifications shall be provided without limiting any other obligation of the SI under this Project Agreement, including the SI's obligation to coordinate with the MBTA and the DB Entity.

- 2.7.1 Once the MBTA has utilized the Complete DB Plans and Specifications to procure a DB Entity, the SI will support the DB Entity through design review and monitoring in accordance with the Contract Standards.
- 2.7.2 The SI must participate in 'over the shoulder' design reviews with the DB Entity and the MBTA during the design phase of DB Installation Work.
- 2.7.3 The MBTA will be considered to have met its obligation to the SI in respect with performance of the DB Installation Work if the DB Installation Work is performed in accordance with the Complete DB Plans and Specifications, as accepted by the MBTA pursuant to this Appendix 2.13.

2.8 Plans Format

All plans must be formatted in accordance the following requirements:

- 2.8.1 All Documentation shall be in English;
- 2.8.2 All measuring units shall be in Imperial;
- 2.8.3 Half scale or 11' x 17" format for printed documents; and
- 2.8.4 Electronic ISO 32000-1:2008 Portable Document Format (PDF) and AutoCAD 2014 (.dwg) file format when submitted electronically.

3. Process Requirements

Prior to the Financial Close Date, the SI must advance the Preliminary DB Plans and Specifications in accordance with the Contract Standards to a level sufficient to create a cost baseline in terms of cost impact to the Systems Integrator for any further changes to the DB Plans and Specifications, including further development to establish the Complete DB Plans and Specifications and any MBTA Change made at a later date (the “**Cost-Certain Specifications**”). The Cost-Certain Specifications, by focusing on elements of the DB Plans and Specifications that are material to the Systems Integrator’s cost of performing the Contract Services, are intended to enable the Parties to achieve Financial Close, recognizing that further development of the Preliminary DB Plans and Specifications may be necessary to establish the Complete DB Plans and Specifications pursuant to this Appendix 2.13. Nothing in this Section is intended to prohibit the Parties from establishing the Complete DB Plans and Specifications prior to the Financial Close Date.

3.1 Preliminary DB Plans and Specifications

Preliminary DB Plans and Specifications must be submitted with the Proposal, as described in Section 1 of this Appendix 2.13.

3.2 DB Plans and Specifications Advancement Plan

The Proposal shall include a description of the proposed approach to advance the Preliminary DB Plans and Specifications to the Cost-Certain Specifications and the Complete DB Plans and Specifications in accordance with the requirements set forth in this Appendix 2.13, including all submittal and review requirements. The Proposal shall identify the elements of the DB Plans and Specifications that will be included in the Cost-Certain Specifications and a proposed submittal protocol for finalizing the Cost-Certain Specifications and the Complete DB Plans and Specifications. [PSR: DB Plans and Specifications Advancement Plan]

3.2.1 The MBTA will review and comment on the proposed submittal protocol for finalizing the Cost-Certain Specifications and the Complete DB Plans and Specifications, as well as the proposed inclusions in the Cost-Certain Specifications within 15 days of the Effective Date.¹

3.2.2 The Parties, acting reasonably, shall agree on the detailed submittal protocol for the finalization of the Cost-Certain Specifications, the Cost Impact Memorandum and the Complete DB Plans and Specifications within 35 days of the Effective Date.¹

3.2.3 The SI shall hold at least one (1) review meeting with the MBTA following receipt of MBTA comments and prior to agreement on the submittal protocol.

3.2.4 Such protocol shall identify all elements of the DB Plans and Specifications that will be included in the Cost-Certain Specifications and any further submittals necessary to finalize the Complete DB Plans and Specifications. Such protocol shall not supersede the rights and responsibilities of the Parties established in Appendix 7 (MBTA Review Procedures), unless mutually agreed by both Parties. [CDRL: Detailed

¹ Note: If the Selected Proposer elects to enter into the Early Works Agreement, these activities will be done under the Early Works Agreement, with the same timelines based on the effective date of the Early Works Agreement. The Selected Proposer is responsible for providing for the work necessary to establish the Cost-Certain Specifications by the Financial Close Deadline in accordance with this Appendix 2.13, either by causing the appropriate Project Contractor to enter into the Early Works Agreement or by entering into the Project Agreement upon or shortly after the Date of Award. The MBTA will not be responsible for, and the Financial Close Deadline will not be extended due to, delays caused by the Selected Proposer in providing for such work.

Submittal Protocol for Finalizing the Cost-Certain Specifications and the Complete DB Plans and Specifications]

3.3 Cost-Certain Specifications and Cost Impact Memorandum

The SI shall develop and submit to the MBTA the Cost-Certain Specifications in accordance with the protocol agreed upon by the Parties pursuant to Section 3.2. The Cost-Certain Specifications shall be accompanied by a memorandum (the Cost Impact Memorandum) prepared by the SI that summarizes the long-term cost implications of the Complete DB Plans and Specifications and a baseline for determining Fundamental DB Modifications. The Cost Impact Memorandum must describe all calculations to be taken to determine the cost impact of any Fundamental DB Modification in accordance with the Contract Standards. The Cost-Certain Specifications must be fully compliant with the requirements for the Complete DB Plans and Specifications, including the inclusions and assumptions listed in Section 4 of this Appendix 2.13 and all other Contract Standards. [CDRL: Cost-Certain Specifications and Cost Impact Memorandum]

3.3.1 Without limiting any requirement of the protocol agreed-upon between the Parties pursuant to Section 3.2, a complete draft of the Cost-Certain Specifications and Cost Impact Memorandum meeting all requirements of this Appendix 2.13 must be submitted to the MBTA not later than 45 days prior to the Financial Close Deadline. The SI shall hold at least three review meetings with the MBTA prior to the submission this draft.

3.3.2 Any submittals that include layout plans described in Section 2.6 of this Appendix 2.13 will be subject to a review period by the MBTA of 20 Business Days.

3.4 Complete DB Plans and Specifications

The SI shall develop and submit to the MBTA the Complete DB Plans and Specifications in accordance with the protocol agreed upon by the Parties pursuant to Section 3.2. The Complete DB Plans and Specifications must be fully compliant with all requirements set forth herein and must address all MBTA comments pursuant to Appendix 7 (MBTA Review Procedures).

3.4.1 Without limiting any requirement of the protocol agreed-upon between the Parties pursuant to Section 3.2, a complete draft of the Complete DB Plans and Specifications meeting all requirements of this Appendix 2.13 must be submitted to the MBTA not later than 20 days after the Financial Close Date. The SI shall perform at least five ‘over the shoulder’ design reviews with the MBTA prior to the submission of this draft.

3.4.2 Any submittals that include layout plans described in Section 2.6 of this Appendix 2.13 will be subject to a review period by the MBTA of 20 Business Days.

3.5 Fundamental DB Modification baseline

The Cost-Certain Specifications, Cost Impact Memorandum and the Complete DB Plans and Specifications, including all submissions and updates thereto, will be subject to review, comment and acceptance by the MBTA, acting reasonably, in accordance with Appendix 7 (MBTA Review Procedures); provided that, the MBTA shall not be entitled to request changes to the proposed Cost-Certain Specifications as a condition to its acceptance other than to correct any failures of compliance or inconsistencies with the requirements of the Contract Standards. The Cost-Certain Specifications, once accepted by the MBTA, will establish the baseline for determining any Fundamental DB Modification. The SI shall not be obligated to implement a Fundamental DB Modification in finalizing the Complete DB Plans and Specifications absent an MBTA Change.

4. DB Plans and Specification Inclusions and Assumptions

Both the Preliminary and Complete DB Plans and Specifications must account for and include the following circumstances, assumptions, and requirements:

- 4.1 The DB Plans and Specifications must include schedules for all DB Installation Work. Such schedules shall include estimates of the time for various DB Installation Work activities in accordance with the following assumptions:
 - 4.1.1 A single Gate with existing power and communications connections shall have an installation time of no less than six (6) elapsed hours.
 - 4.1.2 A single Fare Vending Machine with existing power and communications connections shall have an installation time of no less than four (4) elapsed hours.
 - 4.1.3 A single Validator with existing power and communications connections shall have an installation time of no less than four (4) elapsed hours.
 - 4.1.4 The installation of new power and communications conduit and any additional site work shall have an installation time of no less than six (6) working days per site.
 - 4.1.5 The overall schedule for DB Installation Work shall not be less than four hundred and twenty-two (422) elapsed working days.
 - 4.1.6 The schedule shall assume that DB Installation Work can be completed with no greater than two (2) simultaneous active work crews per Rapid Transit line (i.e. Blue, Green, Orange and Red).

The foregoing assumptions must be reflected in the SI's proposed schedules for the performance of the DB Installation Work but shall not be construed to restrict the MBTA in any manner from providing for early completion of any part of the DB Installation Work.

- 4.2 All schedules (including the phase-in plan) shall be developed and submitted as a resource loaded Critical Path Method (CPM) schedule developed in accordance with MBTA standards in 2.13 Attachment 1 – MBTA Standard Construction Specs and all critical stages, and indicate all equipment that shall be available at each Station in each stage of construction/Installation. All schedules shall include:
 - 4.2.1 Each Defined Phase
 - 4.2.2 Any processes to be completed by the SI that interact with the DB Installation Work (e.g. manufacturing)
- 4.3 Where appropriate, as determined pursuant to Good Industry Practice, the Defined Phases shall enable substantial completion of the applicable DB Installation Work prior to achievement of the related DB Completion Milestone. For example, the DB Installation Work in respect of a Station included within the scope of a particular DB Completion Milestone shall be a Defined Phase.
- 4.4 At no time during Installation may the phase-in plan call for a reduction in the number exit aisles (gates, barriers, or otherwise) during MBTA Operating Times, unless expressly approved by the MBTA.
- 4.5 Compliance shall be maintained with all relevant MBTA standard specs (see Attachment 1 – MBTA Standard Construction Specs) and any adjustments thereto as needed to ensure that the resulting DB Installation Work, combined with the work done by the SI, results in compliance with all Contract Standards.
- 4.6 DB Plans and Specifications shall include performing any and all survey and study work needed to design the DB Installation Work, including provisions for power and communications, and

accounting for assessment of those Locations without as-built AFC 1.0 Equipment documents. This includes, for example, all Green Line D branch Stations and AFC 1.0 FVMs located at sites other than MBTA Stations.

- 4.7 DB Plans and Specifications shall ensure that construction temporary facilities do not impede Revenue Service or egress; that Devices are only mounted to suitable permanent structures; and that DB field offices do not use any MBTA property unless mutually agreed upon. The SI must not assume that use of MBTA facilities for DB field offices is approved.
- 4.8 DB Plans and Specifications shall include protection of all utilities, Station platforms and other MBTA property, as well as local streets and public and private property.
- 4.9 DB Plans and Specifications shall include repair and/or restoration of all parts of every Location impacted by the DB Installation Work to its original or better condition upon completion of the DB Installation Work. If a current code or standard requires an improved condition, the current code applies instead of original condition.
- 4.10 DB Plans and Specifications shall include installation of conduit and ductwork to support Devices. Where practical, all conduit and ductwork shall be installed in a concealed location, or if not concealed, installed so as to be as unobtrusive as possible and painted to be visually compatible with adjacent finishes. AFC 1.0 Equipment-related conduit, walkerduct and ductwork may be reused if suitable to the SI to meet all Contract Standards.
- 4.11 DB Plans and Specifications shall include provisions for power to support all equipment to be installed with 25% spare capacity.
- 4.12 DB Plans and Specifications shall include relocation of lighting, benches, standpipes, public telephones, barriers, fencing, railings and equipment as required to accommodate new or temporarily placed Devices. The DB Plans and Specifications must include relocating existing wayfinding signage and maps, including supporting frames, or replace them with new, when text or graphics changes are required, as necessary to accommodate new or temporarily placed Devices.
- 4.13 DB Plans and Specifications shall ensure a continuous barrier between Paid Areas and non-Paid Areas of Stations, with steps taken to preserve the integrity of the existing divide between such areas, as well as to resolve any existing barrier gaps.
- 4.14 DB Plans and Specifications shall include modification of lighting to provide adequate illumination levels for new or relocated Devices and signage, to meet current MBTA standards (Attachment 1 of this Appendix 2.13).
- 4.15 DB Plans and Specifications must include installing wiring concealed from public areas wherever possible, and conforming to MBTA standards (Attachment 1 – MBTA Standard Construction Specs) and state and local building codes.
- 4.16 The SI can assume utilization of existing electrical power in the Stations and at MBTA properties, subject to Appendix 4.6.
- 4.17 DB Plans and Specifications shall include identifying, designing and installing any electrical equipment necessary to utilize existing voltages, and, if existing power arrangements are not compatible with the System Elements, propose and make necessary alterations.

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- 4.18 DB Plans and Specifications shall include repairing Station finishes as necessary to address all existing finishes damaged during the course of the work. Existing finishes shall be patched to match, and replacement or new finishes shall match existing finishes to the maximum extent possible.
- 4.19 DB Plans and Specifications shall minimize disruption caused by installation activities on passengers to the maximum extent possible, with all disruptions to be approved in advance by the MBTA (acting reasonably). Minimizing disruption shall extend to physical activities that interfere with passenger flows, as well as activities in adjacent areas which create objectionable dust, noise, or fumes in public areas.
- 4.19.1 Advance approval from the MBTA will be required for activities which interfere with Station use by the general public.
 - 4.19.2 The MBTA, acting reasonably, reserves the right to limit all contractor access at Stations.
 - 4.19.3 Access to Locations not via public access points will be subject to advance MBTA review and approval (including work trains and high-rail vehicles).
- 4.20 DB Plans and Specifications shall include obtaining appropriate protection, including flagging or service diversions.
- 4.20.1 Flagging shall be provided by the transportation entity responsible for the Location as described in the ROW Rule Book for the Rapid Transit System or Keolis Roadway Worker Protection for the Commuter Rail System, or Amtrak requirements for the Northeast Corridor (Providence/Wickford Junction/Stoughton Line).
 - 4.20.2 The cost of required flagging protection for DB Installation Work shall be borne by the MBTA. The cost of required flagging protection for SI Installation Work shall be borne by the SI.
- 4.21 The DB Plans and Specifications must not require the MBTA/DB Entity to travel outside the MBTA service area to access or receive System Elements. If delivering directly to Locations, the SI must follow the requirements on delivery in Appendix 4.6. The SI must certify receipt, the handoff and condition of all System Elements for DB Installation Work in writing.
- 4.22 Removal of AFC 1.0 Equipment
Removal shall be considered “Demolition” for purposes of determining any Station finishes or refurbishment that need to be performed after such removal, as defined in the MBTA standard construction specifications (Attachment 1 of this Appendix 2.13).
- 4.22.1 The Complete DB Plans and Specifications must provide that AFC 1.0 Equipment that is not reused be removed from the Locations in accordance with the schedule requirements of this Project Agreement. The Complete DB Plans and Specifications shall ensure that at least one AFC 1.0 FVM will remain at a Station until the earlier of the MBTA’s Notice to Proceed following Transition Period Completion and the date the MBTA provides written notice that it will no longer allow top-ups of AFC 1.0 Media at that Station.
 - 4.22.2 The Complete DB Plans and Specifications must include instructions for handling AFC 1.0 Equipment with extreme care to ensure it is removed without damage, including packaging in a secure and delicate manner to ensure integrity and longevity. Instructions for handling of legacy components shall comply with

instructions in the Scheidt & Bachmann manuals (see Reference Documents).
Requirements related to storage of AFC 1.0 Equipment is provided in Appendix 4.6.

- 4.23 DB Plans and Specifications shall include coordination of all Location work and testing activities with designated MBTA Persons. The SI and DB Entity must review and become familiar with MBTA policies, procedures and schedules and meet with designated MBTA Persons at each Location where the DB Plans and Specifications apply. The specific procedures for Location Installation work and testing activities will vary depending on the work to be performed and the Location of the work. By way of example, the following procedures are the types which the SI must discuss and agree to for each Location:
- 4.23.1 Upon arrival at a Location and before performing any Installation work, contractors are required to check in with a designated MBTA Persons (for example, the on-duty garage/repair foreperson). Just before departure from the Location, contractors must also check out with the designated MBTA Persons.
 - 4.23.2 Contractors are required to work, as appropriate, with designated MBTA Persons for certain areas with access restrictions, including: closets, rooms and facilities adjacent to an active right-of-way; and areas with controlled access points.
 - 4.23.3 Contractors are required to work with designated MBTA Persons to determine the needs for worksite set-up and break-down at the start and end of any working period at each Location.
 - 4.23.4 The MBTA will designate an MBTA Person to serve as the point of contact for any safety-related issues at each Location. Such person must be notified in the event of a safety-related issue.
- 4.24 DB Plans and Specifications must include coordination of all Location work with any other contractors working in the Location.
- 4.25 DB Plans and Specifications shall comply with all Contract Standards, including Device standards, Quantity Standards (Appendix 2.10), Accessibility requirements (Appendix 2.9), safety requirements (Appendix 2.11) and testing requirements (Appendix 2.16), including work needed to allow for demonstrations.
- 4.26 No deviations from the foregoing requirements will be permitted unless expressly approved by the MBTA.

5. Additional DB Work

The MBTA shall have the right to require the DB Entity to perform work under the DB Contract which is not reflected in the DB Plans and Specifications, including work associated with any MBTA Change pursuant to Section 1.4.1 of Appendix 2.9. The MBTA shall use reasonable efforts to cause any such additional work to be performed by the DB Entity so as not to impact the critical path of planned Implementation Work in the Project Schedule most recently accepted by the MBTA. The Systems Integrator acknowledges and agrees that, except to the extent any such additional work increases the Systems Integrator's costs of performing the Contract Services, any such additional work which does not impact the critical path of planned Implementation Work in the Project Schedule most recently accepted by the MBTA will not give rise to any Supervening Event relief to the Systems Integrator.

6. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using an approach similar to that described in this Appendix 2.13.

The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed an approach similar to that required herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.14, 2.16 and 5. [PSR: Proposer team experience: Implementation, expansion, DB oversight and testing]

APPENDIX 2.14

PROCUREMENT AND EXECUTION SUPPORT FOR DB INSTALLATION WORK

The SI shall provide services to support the MBTA in the procurement, administration, execution, and closeout of the DB Installation Work in accordance with the Contract Standards, including the requirements set forth in this Appendix 2.14.

The Proposal shall address the Technical Requirements set forth in this Appendix 2.14 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the requirements specified in this Appendix 2.14 and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Procurement and Execution Support for DB Installation Work general approach]

1. DB Installation Work Procurement

The SI shall support the MBTA in procurement and contract administration of the DB Installation Work, which support shall include the following:

- 1.1 The SI shall respond to all questions relating to the DB Plans and Specifications posed by bidders competing for the DB Contract, including by providing technical clarification and revisions to the DB Plans and Specifications where necessary in accordance with Good Industry Practice. All such responses shall be provided to the MBTA for distribution to the competing firms. Absent written authorization from the MBTA, the SI shall not directly contact any bidder competing for the DB Contract regarding the procurement or the DB Plans and Specifications. [CDRL: Response to DB Installation Work questions]
- 1.2 The SI shall conduct hands on demonstrations of all System Elements (including handling and installation requirements, power and data connectivity, test procedures, functionality and subcomponent makeup of all Devices) in scope of the DB Installation Work to bidders competing for the DB Contract. Such demonstrations shall be at a facility in the MBTA Service Area that the SI shall make available, at its own cost and expense, for a period of at least two (2) weeks, for a minimum of eight (8) hours per day. The MBTA will coordinate with the SI and provide reasonable notice to the SI of the specific dates for such demonstrations, which will be based on the procurement schedule for the DB Contract. The equipment used for purposes of such demonstration may be the same equipment identified in RFP Section 2.13.1 rather than actual System Elements; provided that the SI shall be responsible for ensuring understanding of any differences between the equipment used and the actual System Elements. [CDRL: Demonstration to DB Proposers]
- 1.3 At the request of the MBTA, the SI shall review technical proposals, including drawings and technical submittals, submitted in response to the MBTA's procurement documents for the DB Contract, and shall provide written assessment of such materials to the MBTA, including as to the capability of the firms and the suitability of the proposed approaches to carry out the DB Installation Work. The SI shall be subject to the same review periods available to the MBTA, as described in Appendix 7, and shall provide its assessments in accordance with Good Industry Practice. Without limiting any obligation of the MBTA hereunder in respect of the DB Installation Work, the MBTA reserves the right to make all final determinations concerning technical proposals

and the selection of the DB Entity. [CDRL: Written assessment of DB Installation Work proposal submittals]

- 1.4 At the request of the MBTA, the SI shall review price proposals submitted in response to the MBTA's procurement documents for the DB Contract (including initial price proposals and any subsequent price proposals pursuant to any revised RFP or best-and-final offer process), and shall provide written assessment of such pricing information in accordance with Good Industry Practice. Without limiting any obligation of the MBTA hereunder in respect of the DB Installation Work, the MBTA reserves the right to make all final determinations concerning price proposals and the selection of the DB Entity. [CDRL: Response to bids for DB Installation Work]

2. DB Contract Administration

- 2.1 The SI shall review design submittals prepared in the course of the DB Installation Work, including all architectural and Location design drawings, at each discrete phase of design development (as established by the DB Plans and Specifications), and as otherwise required by Good Industry Practice. The SI shall review and provide comments to such design submittals in accordance with Good Industry Practice and the requirements specified in Section 2.4 of this Appendix 2.14, including by providing an assessment as to whether the drawings include all electrical and data conduit locations, equipment placements, proposed electrical load versus existing electrical load, and all other information required by the DB Plans and Specifications. SI shall identify further modifications needed to ensure compliance with the DB Plans and Specifications and that the System will operate properly and in accordance with the Contract Standards.
- 2.2 The SI shall review the submittals (all drawings, product submittals and other submittals required by the DB Plans and Specifications) and verify that the designs are consistent with the DB Plans and Specifications and all other applicable Contract Standards, including that proper conduits, wiring, power and other elements are included to ensure that the equipment will be able to be properly installed. Where deficiencies exist, the SI shall markup the drawings to include the necessary elements. [CDRL: Markups of DB Installation Work design drawings]
- 2.3 The SI shall conduct 'over the shoulder' design reviews with the MBTA and the DB Entity in accordance with the Contract Standards to provide feedback on drawings and other design submittals prepared during the course of the performance of the DB Installation Work.
- 2.4 For all reviews and inspections required in this Appendix 2.14, the SI shall, within 14 days of its receipt of the submittal or the conclusion of the inspection (or within such longer or shorter time as may be specified in this Appendix 2.14 or Section 6.5 of the Project Agreement, as applicable to the particular submittal or inspection), take one of the following actions, in addition to providing all response information required by this Appendix 2.14:
 - 2.4.1 When a design submittal or component of the DB Installation Work subject to inspection complies fully with the noted standards and requirements, the SI shall advise the MBTA as such in writing.
 - 2.4.2 When a design submittal or component of the DB Installation Work subject to inspection does not comply with the noted standards or requirements, the SI shall advise the MBTA as such in writing, provide explanation of which specific standards or requirements are not satisfied, and make recommendations to the MBTA for required resubmission or correction.

- 2.4.3 When a design submittal or component of the DB Installation Work subject to inspection has only minor deviations from the standards or requirements, and the SI believes those deviations will not impact the outcome, the SI shall explain that in writing to the MBTA. [CDRL: Responses to DB Installation Work design submittals and inspections]
- 2.5 The SI shall promptly correct any errors, omissions or other deficiencies in the DB Plans and Specifications and, without limiting any other requirement under this Project Agreement, shall support the MBTA in accordance with the Contract Standards in connection with any resulting change order required under the DB Contract.
- 3. Provision of System Elements and Coordination of Implementation Work with DB Installation Work**
- 3.1 The SI shall coordinate and schedule the Implementation Work with the DB Installation Work schedule in accordance with the Contract Standards. Coordination and dependencies of the work shall be reflected in the Project Schedule (which shall include identification of each DB Completion Date), the Project Management Plan described in Appendix 2.11, and the Complete DB Plans and Specifications described in Appendix 2.13.
- 3.2 The SI shall be responsible, at its own cost and expense, for storing, transporting and delivering System Elements necessary for the performance of the DB Installation Work in accordance with the DB Plans and Specifications. The SI shall be responsible for ensuring that such System Elements are available for the performance of the DB Installation Work in accordance with the Project Schedule. The SI shall coordinate with the MBTA and the DB Entity to make such System Elements either available for pickup at an SI Location, or delivery to Project sites.
- 3.3 The SI shall coordinate handoff from the MBTA or DB Entity to the SI of removed AFC 1.0 Equipment, and the SI shall store the AFC 1.0 Equipment at an SI Location, as described in Appendix 4.6.

4. DB Installation Work Execution and Closeout Oversight

The SI shall support, monitor, review, and inspect the DB Installation Work in accordance with the Contract Standards, including compliance with the following:

- 4.1 The SI shall provide (to the MBTA and the DB Entity) oversight and technical support in respect of all Installation in the scope of the DB Installation Work.
- 4.1.1 The SI shall make available full and competent engineering services to handle and correct all problems associated with the performance of System Elements. SI's specialized field representatives shall be present for the installation of System Elements when required in accordance with Good Industry Practice.
- 4.1.2 The SI shall provide training to the DB Entity on handling, use, and Installation of the System Elements to be provided by the SI to the DB Entity for use in the DB Installation Work. Training shall include manuals, syllabuses, outlines and all materials, as further described in Appendix 2.11. [CDRL: DB Entity training program]
- 4.2 The SI shall consult with and advise the MBTA and the DB Entity on specific problems as they arise during construction.
- 4.2.1 The SI shall prepare elementary and supplementary sketches required to resolve problems due to actual field conditions encountered. The SI shall also prepare working plans and

- specifications for any change orders that are required due to SI design decisions or Systems Integrator Fault, including in connection with the correction of errors, omissions or other deficiencies in the DB Plans and Specifications.
- 4.2.2 The SI shall review detailed construction drawings and shop erection drawings submitted by the DB Entity for compliance with the approved design, drawings and specifications and all other applicable requirements.
- 4.2.3 The SI shall review laboratory, shop and mill test reports (and similar reports) on materials and equipment for the purpose of compliance with all applicable requirements and standards.
- 4.3 The SI shall update the phase-in plan and Project Schedule CPM charts required in Appendix 2.13 whenever the actual situation changes, and make those updates available continuously to the MBTA. [CDRL: Updated phase-in plan and CPM charts]
- 4.3.1 Throughout the Implementation Period, the SI shall update and maintain the Project Schedule to reflect actual progress of the DB Installation Work, shall review schedules prepared by the DB Entity for compliance and consistency with the Project Schedule and shall address any inconsistencies between the schedules in accordance with the Contract Standards. [CDRL: Project Schedule update]
- 4.4 The SI shall update the installation and interface plan required in Appendix 2.13 if and when anything about the plans changes during field work. [CDRL: Updated installation and interface plan]
- 4.5 Without limiting Section 4.1 of this Appendix 2.14, the SI shall make Project site visits to observe that work is proceeding in accordance with the DB Plans and Specifications, and to observe the progress at intervals appropriate to the various stages of construction and the quality of the executed work in order to determine if the work is proceeding in accordance with all requirements of the DB Plans and Specifications. Scheduled Project site visits shall be included on the Project status dashboard required pursuant to Appendix 2.11. The SI shall promptly submit to the MBTA a detailed written report subsequent to each Project site visit. [CDRL: Site visit reports]
- 4.6 SI shall assist the DB Entity in coordinating all Location work with MBTA Personnel. To do so, the SI and DB Entity shall review and become familiar with MBTA policies, procedures and schedules and meet with managers of each Location where the DB Entity will be working. The specific procedures for Location maintenance work will vary depending on the work to be performed and the Location of the work. By way of example, the following procedures are the types which the DB Entity shall discuss and agree to for each Location:
- 4.6.1 Upon arrival at a Location and before performing any work, the DB Entity must check in with a person designated by the MBTA (for example, the on-duty garage/repair foreperson). Just before departure from the Location, the DB Entity must also check out with a person designated by the MBTA.
- 4.6.2 The DB Entity must work, as appropriate, with MBTA-designees for certain areas with access restrictions: closets, rooms and facilities adjacent to an active right-of-way; areas with controlled access points; and Commuter Rail non-station facilities.
- 4.7 The SI shall attend regular project progress meetings held by both the MBTA and the DB Entity (as defined in the Complete DB Plans and Specifications). The DB Entity will be responsible for preparing meeting agendas and recording and distributing meeting minutes to appropriate participants, and the SI shall review and approve all meeting minutes. [CDRL: Review and approval of agendas and minutes for DB Installation Work meetings]

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- 4.8 During the course of construction, requests for information or clarification (RFI/RFC) may be submitted by the DB Entity. The SI shall respond to each such request within fourteen (14) days; provided that, if the response is reasonably required in order to avoid impediment to active construction progress and the RFI/RFC is notated as such, the SI shall respond promptly and in no case more than five (5) Business Days after the request. The SI shall maintain each submitted RFI/RFC and its response in the Document Control System. [CDRL: DB Installation Work RFIs/RFCs]
- 4.9 The SI shall review any-proposed change to the DB Plans and Specifications and, if the SI approves the change (subject to Section 6.5(C) of the Project Agreement), submit an attesting “design approval letter” to the MBTA within 14 days of receipt of the change. The design approval letter shall include a statement indicating that the SI has reviewed and approved the proposed changes, and confirmation that the changes are consistent with respect to the intent of the design. The letter should also address any anticipated impact to schedule and confirmation that the work is necessary and not already required by the DB Plans and Specifications. A design approval letter will be required for each change. If the SI is unable to provide a design approval letter in accordance with this Section 4.9, the SI shall respond in accordance with Section 2.4 of this Appendix 2.14 by the due date for the design approval letter. [CDRL: Design approval letters]
- 4.10 The SI shall participate in inspections required to determine substantial completion and final completion of each Defined Phase, and report on compliance with the DB Plans and Specifications in accordance with Section 2.4 of this Appendix 2.14 and Section 6.5(G) of the Project Agreement. The SI shall confirm acceptable punch lists pursuant to the DB Plans and Specifications, monitor resolution of punch list items, and in assist the MBTA in determining whether closeout requirements of the DB Contract have been met for each Location. [CDRL: Report of DB Entity closeout requirements]
- 4.11 The SI shall review and comment on the DB Entity’s submitted as-built drawings in accordance with this Appendix 2.14. [CDRL: Comments on DB Entity’s as-built drawings]

5. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach similar to that described in this Appendix 2.14. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed an approach similar to that required herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.13, 2.16 and 5. [PSR: Proposer team experience: Implementation, expansion, DB oversight and testing]

APPENDIX 2.15

RETAIL

The System may make available Retail Reload Locations through which a User may acquire Fare Cards, purchase Stored Value Products, and pay Enablement Fees. The System shall be capable of including commercial point of sale terminals located at locations other than Retail Reload Locations. The requirements stated below shall also be applied in conjunction with other Contract Standards, including the closed-loop Fare Media (in Appendix 2.6), Accessibility and language (in Appendix 2.9) and Quantity Standards (in Appendix 2.10).

The Proposal shall address the Technical Requirements set forth in this Appendix 2.15 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Retail general approach]

1. Optional Use of Retail Reload Locations

As described in Appendix 2.10, the SI may choose to provide solely Fare Vending Machines to fulfill the Coverage Principle for Point of Sale Locations. In that case, the requirements of this Appendix 2.15 still apply to the Administrative Point of Sales terminals described in Section 5 of this Appendix 2.15. If the SI chooses not to solely use Fare Vending Machines for purposes of meeting the Coverage Principle for Point of Sale Locations, then the requirements of this Appendix 2.15 apply to Retail Reload Locations.

2. Management of Retail Reload Locations

2.1 Quantities

The Retail Reload Locations shall meet the Quantity Standards in Appendix 2.10. The System may also include additional Locations that exceed the Quantity Standards in order to provide a greater level of coverage.

2.2 Retailer Relationships

2.2.1 The SI is required to recruit, engage and manage the participation of Retail Reload Locations. Retail Reload Locations shall include convenience and grocery stores, pharmacies, local shops and other similar establishments.

2.2.2 The SI shall manage all relationships and contracts with Retail Reload Locations, including negotiating and paying all applicable service fees and commissions.

2.3 Servicing

2.3.1 The SI shall provide support to retailers to resolve issues and Problems, including the placement and merchandising of Fare Cards by at Retail Reload Locations.

2.3.2 The SI shall provide management of sales at Retail Reload Locations, and corroborate all transactions and balances in the System for Media. The SI shall be responsible for all communication, invoicing, settlements, reporting, reconciliation and dispute resolution with retailers. The SI shall guarantee payment of all funds due to the MBTA from Product sales and reloads as specified in Appendix 4.2 regardless of whether the Retail Reload Location pays the SI.

2.3.3 The SI shall distribute Standard Fare Cards to Retail Reload Locations.

2.4 Monitoring and Reporting

- 2.4.1 The SI shall monitor the status of the Retail Reload Locations and report on it quarterly to the MBTA. [CDRL: Retail Reload Locations quarterly report]
- 2.4.2 The Retail Reload Locations shall meet the Accessibility standards in Appendix 2.9. The SI shall monitor Accessibility compliance of Retail Reload Locations as described in Appendix 2.9.
- 2.4.3 Retailers that are no longer Retail Reload Locations shall be replaced with new Points of Sale to meet the Coverage Principle as described in Appendix 2.10. Removals from and additions to Retail Reload Locations shall be explained in the quarterly report.
- 2.4.4 The list of Retail Reload Locations shall be provided to the MBTA in the Inventory of POS Locations described in Appendix 2.10. [CDRL: List of Retail Reload Locations]
- 2.4.5 The SI shall monitor the Retail Reload Locations for Locations that show unusually high or low sales and usage volume compared to previous months, and shall investigate and report to the MBTA any significant changes. The SI shall remove any Retail Reload Locations not complying with Retail Reload Location requirements discovered during these investigations.

2.5 Retailers may not require Users to make additional purchases in order to purchase Fare Products.

3. Point of Sale Terminal Integration

The Fare Card purchase and Media reload process must either be integrated with existing retail merchant point of sale terminals or be performed by a System Element provided by the SI and utilized at all retailers. An integration with existing point of sale terminals is preferred.

The SI's Proposal shall describe the point of sale implementation for Retail Reload Locations. [PSR: Point of sale implementation]

4. Retail Functionality

4.1 Media

- 4.1.1 Fare Cards and the Mobile Fare Card shall be able to be scanned at all Retail Reload Locations and Administrative Point of Sales. A barcode or other optical method is permitted on the Mobile Fare Card for this purpose, as further described in Appendix 2.6.
- 4.1.2 Accounts shall be reloadable via Fare Cards and the Mobile Fare Card at all Retail Reload Locations and Administrative Point of Sales.
- 4.1.3 The System shall support the payment of Enablement Fees at all Retail Reload Locations and Administrative Point of Sales.
- 4.1.4 Standard Fare Cards shall be available for purchase at Retail Reload Locations.

4.2 Payments

Cash, credit, debit, and transit-benefit specific cards shall be able to be utilized by Users at all Retail Reload Locations and Administrative Point of Sales, except that those Retail Reload Locations that do not accept Payment Cards for other gift card products may choose to only accept cash for MBTA Users.

4.3 Balance

The System shall provide Fare Card Account Balance to be printed on the purchase receipt or otherwise provided to Users at all Retail Reload Locations and Administrative Point of Sales.

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- 4.4 Product Sales
 - 4.4.1 The System shall support Users in purchasing Stored Value at Retail Reload Locations and Administrative Point of Sales.
 - 4.4.2 The System shall be Configurable to allow specific values, if added at a Retail Reload Location or Administrative Point of Sales, to be instead delivered to the User as a Pass Product. Account management functionality related to this requirement is further described in Appendix 3.8.
 - 4.4.3 The Administrator Interface shall support Administrators in converting Stored Value to a Pass Product, as further described in Appendix 3.8.
 - 4.5 Fare Card Activations and Product purchases shall be completed at the Retail Reload Location or Administrative Point of Sales and shall not require any additional User Interaction with any additional Sales Channels. By way of example, the User shall not be required to call the IVR and enter an Activation code.
 - 4.6 Retail functionality described in this Section 4 shall be subject to Design Review and User Testing.
 - 4.6.1 The SI's Proposal shall describe a conceptual design for retail functionality, including:
 - 4.6.1.1 How Account Balance will be provided to Users.
 - 4.6.1.2 How a new Fare Card gets Activated.
 - 4.6.1.3 How value is added to an existing Fare Card.
 - 4.6.1.4 How value is added to a Mobile Fare Card.
 - 4.6.1.5 How a specified reload amount will be delivered to the User as a Pass Product.
 - 4.6.1.6 How receipts will be provided to Users.
 - 4.6.1.7 Whether Fare Cards will be displayed on shelves at Retail Reload Locations or held behind the counter.

[PSR: Retail functionality conceptual design]
 - 4.6.2 During Preliminary Design Review, the SI shall update the Submittal described in Section 4.6.1 of this Appendix 2.15 based on the feedback from the Conceptual Design Review.

[CDRL: Retail functionality preliminary design]
 - 4.6.3 The final design of the retail functionality shall include a prototype point of sale terminal.

[CDRL: Retail functionality final design]

5. Administrative Point of Sales

Administrative Point of Sales (APOS) are MBTA-designated locations which provide in-person customer service through the use of all functionality described in Section 4 of this Appendix 2.15 and the Administrator Interface described in Appendix 3.8. Such locations are designed to handle complex queries and service specific groups of Customers and may include walk-in locations staffed by MBTA Persons, the MBTA's Ferry operators at their Terminals, Transportation Service providers, government offices and non-profit agencies.

- 5.1 The System shall be capable of including commercial point of sale terminals located at MBTA-designated locations other than Retail Reload Locations. The SI is not responsible for the acquisition of additional point of sale terminals, but the System shall accommodate the inclusion of terminals at no additional cost to the MBTA.
- 5.2 The System shall implement Accounts to be used by Administrative Point of Sales as a deposit target and source of Value to enable using the Administrative Point of Sales to add Products to other Accounts ("APOS Funds Pool").

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- 5.2.1 The System shall implement an APOS Funds Pool for each Administrative Point of Sales (unless the MBTA, in its discretion, requests that an APOS Funds Pool applies jointly across more than one Administrative Point of Sales) for purposes of transferring Value from the APOS Funds Pool to a User Account using these APOS locations.
 - 5.2.2 Value shall only be transferred to Accounts from Value in an APOS Funds Pool on a pre-paid basis. The System shall not provide Payment Card processing, cash servicing, or check/ACH acceptance functionality at Administrative Point of Sales.
 - 5.2.3 The System shall provide a method for Administrative Point of Sales Administrators to purchase Value for the APOS Funds Pool, check balance, receive notifications of low balance, and report on and extract Data about reloads processed.
 - 5.2.4 Purchase of Value for an APOS Funds Pool shall, at a minimum, be accepted from Administrative Point of Sales Administrators using ACH payments. The APOS Funds Pool shall be implemented in a manner consistent with the requirements in Appendix 4.7.
 - 5.2.5 None of the Data made available to Administrative Point of Sales Administrators as part of the APOS Funds Pool reports or extracts shall include any Personally Identifiable Information as defined in Appendix 3.1A.
- 5.3 The SI shall provide integration guidance and Documentation for what point of sale systems are supported for integration and shall provide ongoing technical support for the activation and functionality of those integrations. [CDRL: Documentation for Administrative Point of Sales terminals]
- 5.4 The SI's Proposal shall identify what point of sale systems are supported for integration. [PSR: Point of sale implementation]

6. Future Features

- 6.1 The System shall be capable of implementing the following future features if requested by the MBTA as an MBTA Change:
- 6.1.1 Allow reload to an Account from alternative financial services that come to be used by a significant number of Users (such as peer-to-peer financial services and non-traditional banking services);
 - 6.1.2 Allow SMS text money reloads to an Account; and
 - 6.1.3 As other alternative financial services and mobile payment methods emerge during the Term which primarily serve, among others, unbanked and underbanked users, the SI shall diligently work with the MBTA to efficiently implement these methods, as reasonably determined by the MBTA.
- 6.2 The SI shall indicate in its Proposal how it will ensure the System is designed to facilitate such future features and shall provide assurance that the SI understands the importance of providing that support. [PSR: Support for future retail features]

7. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.15. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.10. [PSR: Proposer team experience: Quantity Standards and retail]

APPENDIX 2.16

FUNCTIONAL AND PERFORMANCE TESTING

The SI shall develop and execute a comprehensive testing protocol to document, verify and prove that the System is fully compliant with the Contract Standards.

1. Testing Protocol

1.1 Objectives

The testing protocol shall consist of a series of tests, inspections, certifications and demonstrations designed to validate that the System is fully operational and ready for Revenue Service and will not negatively impact MBTA operations and Revenue collection by proving that it:

- 1.1.1 Meets all safety and environmental standards as described in the Contract Standards.
- 1.1.2 Meets all functional, business and operating requirements as described in the Contract Standards.

1.2 The SI shall, in accordance with the Contract Standards:

- 1.2.1 Provide all necessary facilities, equipment, resources and Personnel for the safe and effective performance of all tests, inspections and demonstrations.
- 1.2.2 Perform all tests, inspections, and demonstrations used to satisfy these requirements at the Model Office as described in Appendix 2.4.
- 1.2.3 Develop and document Test Plans: written procedures that describe test activities, methodologies and measurements of success.
- 1.2.4 Document and report on test results (“Compliance Reports”).
- 1.2.5 Develop and document Remediation Plans which describe remedial actions for all failures and Defects.
- 1.2.6 Remediate all failures and Defects and retest after remediation.
- 1.2.7 Maintain an inventory of each requirement and how compliance was demonstrated (“Compliance Matrix”).
- 1.2.8 Schedule and execute all phases of testing, and integrate these with the overall implementation plan described in Appendix 2.11.
- 1.2.9 Re-perform tests and achieve successful outcomes for each before proposing removal of any item from a Punch List.

1.3 The Test Plans, Compliance Reports, Remediation Plans and Compliance Matrix shall be submitted to the MBTA for its reasonable approval in accordance with Appendix 7 (MBTA Review Procedures).

1.4 Demonstrations

- 1.4.1 The SI shall provide a live demonstration of all functional tests and any MBTA requested performance tests. [CDRL: Demonstration of functional tests] [CDRL: Demonstration of performance tests]
- 1.4.2 The SI shall, directly and by reflecting applicable requirements in the DB Plans and Specifications, provide a demonstration of the Gate Option(s) selected by the SI as described in Appendix 2.3 (“Gate Transition Demonstration”).
 - 1.4.2.1 The Gate Transition Demonstration shall be performed at both the MO Non-Revenue Station and the MO Physical Space described in Appendix 2.4.

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- 1.4.2.2 If the SI's selected Gate Option uses AFC 1.0 Gates, the MBTA will provide two (2) Legacy Gate 1 AFC 1.0 Gates for the SI's use in prototyping. Additionally, the MBTA will provide Legacy Gate 1 AFC 1.0 Gates for the MO Physical Space and the MO Non-Revenue Space to be used as part of the Gate Transition Demonstration. If the SI's selected Gate Option reuses Legacy Gate 2 AFC 1.0 Gates, the SI shall coordinate with the MBTA to investigate and work with such Legacy Gate 2 AFC 1.0 Gates so as to ensure that there is no interruption to Revenue Service.
 - 1.4.2.3 The Gate Transition Demonstration shall demonstrate each stage of the SI's Gate Option(s) consistent with the requirements of Appendix 2.3.
 - 1.4.2.4 The timing of the Gate Transition Demonstration depends on the Gate Option(s) proposed, as described in Appendices 5.2 and 5.4.
[CDRL: Gate Transition Demonstration]
 - 1.4.3 Actual Devices must be available and used for all tests, inspections, and demonstrations relating to Devices and Device functionality.
 - 1.4.4 All demonstrations shall take place at the MO Physical Space except as otherwise identified in this Appendix 2.16 or, at SI request by MBTA discretion.
 - 1.4.5 The SI shall provide written notice of each scheduled demonstration no later than five (5) Business Days prior to the demonstration. Written notice shall include a description of the areas of compliance that will be demonstrated and the tests to be performed. [CDRL: Notice of scheduled demonstrations]
 - 1.4.6 The SI must re-perform any demonstration that includes a failure or Defect.
 - 1.4.7 In the event that any scheduled set of tests, inspections, or demonstrations has a 15% or higher rate of failures or Defects (or another outcome other than success), the demonstration shall stop (unless the MBTA, in its discretion, specifically grants an exception) and the SI shall develop a Remediation Plan to explain the work that will be completed to resolve the failures and Defects (or rectify another outcome other than success). The SI shall implement any such Remediation Plan and document all the work completed by the SI to resolve the failures and Defects (or rectify another outcome other than success) in a Compliance Report prior to the MBTA devoting further resources to attending demonstrations. [CDRL: Remediation Plan]
 - 1.4.8 The SI shall continue re-performing demonstrations and corrective actions until all required demonstrations have successfully been completed. [CDRL: Repeat demonstrations]
- 1.5 MBTA right to inspect. Without limiting any other right or requirement herein, MBTA Persons may:
- 1.5.1 Request changes to Test Plans, including testing approach evaluation criteria.
 - 1.5.2 Observe SI's tests, inspections and demonstrations.
 - 1.5.3 Review Compliance Reports to ascertain compliance. If the MBTA challenges a test approach or outcome, the SI shall provide clarification and, if requested by the MBTA, retest or demonstrate in order to prove compliance.

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- 1.6 Tests used to demonstrate compliance shall use actual cash. The cash alternative permitted for use in the Model Office is not acceptable for demonstrating compliance.
 - 1.7 The SI may elect to run multiple streams of testing concurrently, provided that System Elements with interdependencies are grouped together.
 - 1.7.1 All Variants of each Device Type shall undergo testing phases together except that:
 - 1.7.1.1 The approach to Gate Option 4 may be tested separately from other Gates to allow for earlier Installation.

2. Phases

The SI shall allow adequate time to plan, test, remediate and report during each phase of testing.

- 2.1 Pre-Production Certification of Readers

The SI shall engage an EMV certified testing laboratory to test electrical and environmental Reader requirements prior to manufacturing and confirm compliance with EMV Level 1. [CDRL: Letter of conformance Level 1 EMV]
 - 2.2 Review of Final Design for Readers

As part of the Final Design Review for Readers, and before the Readers are installed, the SI shall make a prototype of the Reader (and any Variants thereof) available for inspection.
 - 2.2.1 The Reader inspection shall be completed by an MBTA Person.
 - 2.2.2 The Reader inspection shall be designed to confirm that the Reader as designed will be able to meet all of the Contract Standards.
 - 2.2.3 The SI shall allow the third party inspector to access any proprietary information necessary to complete the inspection. The SI may require the third party inspector to sign a non-disclosure agreement to the extent reasonably necessary to protect the confidential and proprietary nature of such information.
 - 2.2.4 In the event that the Reader inspection identifies any discrepancy between the Technical Requirements, the Reader proposal and the Reader prototype, the SI shall resolve this by modifying the Reader prior to Installation.
- 2.3 SI Internal Testing and QA

The SI shall conduct its own internal testing protocol, including testing in accordance with Good Industry Practice, the Quality Assurance plans, Accessibility and safety testing (as described in Appendix 2.3 and Appendix 2.11), prior to the phases described below in order to minimize failures and Defects during the phases in which the MBTA is involved. The Documentation described in this Appendix 2.16 as outputs from other tests and demonstrations is not required for the SI's own internal testing, and these tests do not need to take place in the Model Office.
- 2.4 Safety Testing for Devices
 - 2.4.1 The SI shall engage a nationally recognized testing laboratory to complete safety tests on all Variants of Customer-Facing Devices and deliver test reports to the MBTA no later than

- thirty (30) days prior to the Installation Commencement Date, as described in Appendix 2.3. [CDRL: Device Safety Test Report]
- 2.4.2 The SI shall demonstrate the safety of Inspection Devices either by completing safety tests and providing test reports to the MBTA or through the MBTA approval of a testing waiver no later than thirty (30) days prior to the Pilots, as described in Appendix 2.7.
- 2.5 **Demonstrating Compliance of System Elements for Installation**
The SI shall complete testing on and certify compliance for any System Element at least thirty (30) days prior to any Installation of the same. During this pre-Installation testing, the SI shall prove that all System Elements to be installed will function successfully and not negatively impact MBTA Revenue Service, Transportation Services, safety, information security, and Accessibility.
- 2.5.1 If the SI's Gate Option selection (selected as provided in Appendix 2.3) involves multiple stages, each stage shall be fully tested prior to any Installation of any Gate or any System Element on or around an AFC 1.0 Gate.
- 2.6 **Pre-Pilot Certification of Readers**
- 2.6.1 The SI shall engage an EMV certified testing laboratory to test the Readers prior to any Pilots and confirm compliance with EMV Level 2. [CDRL: Letter of conformance Level 2 EMV]
- 2.6.2 The Acquirer and any other Payment Services Provider that will be involved in Payment Card processing shall test the System prior to any Pilots and confirm compliance with applicable Payment Industry Standards (sometimes referred to as EMV Level 3). [CDRL: Certification of Level 3 Contactless EMV]
- 2.7 **Demonstrating full System Compliance**
The SI shall complete testing on and certify compliance for all System Elements on the fully integrated System thirty (30) days prior to the commencement of the Pilots, as further defined in Appendix 5.3. During pre-Pilot testing, the SI shall prove that the System is ready to support Revenue Service.
- 2.8 **Throughout the Term**
Tests shall be repeated throughout the Term as appropriate following any additional Configuration or change as described in Appendix 4.3.
- 3. Testing Outcomes**
- 3.1 **Evaluation**
All tests shall be evaluated on a pass/fail basis against the Contract Standards. If a testing result meets the predefined criteria for success and complies with the Contract Standards, the test shall be given a pass grade. If a test result does not meet the predefined criteria for success, the test shall be given a fail grade, be treated as Defect, an explanation shall be provided in the Compliance Report, and the SI shall proceed with a Remediation Plan and all required remedial action.
- 3.2 **Defect Reporting**
- 3.2.1 During all tests, inspections and demonstrations, all Defects, including unexpected errors and delays, operating malfunctions, System defects, process and sequencing issues, and all other anomalies that produce an unexpected result shall be logged and included in the Remediation Plan. The Remediation Plan shall include all Defects encountered during the test, even if the Defect did not result in a fail grade.

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- 3.2.2 The SI shall analyze all Defects for root causes and include the results of such analysis in and a description of remedial action in the Remediation Plan.
- 3.2.3 If the SI discovers a Defect in the Model Office for a System Element in Revenue Service, the SI shall adhere to notification and resolution requirements described in Appendix 4.6 and Appendix 8.
- 3.3 Reporting on Test Outcomes
Within ten (10) days of each test, inspection or demonstration, the SI shall document the outcome in a Compliance Report and submit it to the MBTA. The Compliance Report shall include: a description of the test, inspection or demonstration performed, a summary of all results and any relevant certificates of inspection and approvals. [CDRL: Compliance Report]
- 3.4 Remediation
- 3.4.1 Whenever a test, inspection or demonstration that has been performed to prove compliance results in a failure or Defect, the SI shall submit a Remediation Plan alongside the Compliance Report within ten (10) days of the test. The Remediation Plan shall explain any failure to meet Contract Standards and describe the corrective action that the SI will take to resolve any areas of non-compliance. [CDRL: Remediation Plan]
- 3.4.2 The SI shall implement remedial action, at no cost to the MBTA, to resolve all areas where a System Element does not meet the Contract Standards.
- 3.4.3 The SI shall resolve all areas of non-compliance and repeat tests, demonstrations or inspections required to demonstrate compliance. An updated Compliance Report shall be provided within ten (10) days of the repeated test, inspection or demonstration. [CDRL: Updated Compliance Report]
- 3.5 Compliance Matrix
- 3.5.1 The SI shall maintain a Compliance Matrix, which includes all System Elements and all Technical Requirements.
- 3.5.1.1 The MBTA intends to provide an Excel template to serve as the basis for the Compliance Matrix.
- 3.5.1.2 The requirements captured for use on the Compliance Matrix shall capture every word (except for headers, footers, and headings which do not form part of a sentence) in the Technical Requirements.
- 3.5.2 The Compliance Matrix shall include a master list of all tests, inspections and demonstrations used to prove compliance. [CDRL: Master list of tests]
- 3.5.3 For each requirement, the Compliance Matrix shall identify each test, inspection, demonstration, or document required and implemented by the SI to confirm and certify compliance.
- 3.5.4 The Compliance Matrix shall and include the dates that compliance was initially and most recently demonstrated.
- 3.5.5 The SI shall submit a first draft version of the Compliance Matrix for MBTA review and approval within ninety (90) days of the Effective Date. The SI shall further develop and revise the Compliance Matrix as required to obtain MBTA approval prior to any testing. The Compliance Matrix shall be updated following each phase of testing and throughout the Term (including based on retesting required in accordance with Appendix 4.3). [CDRL: Draft Compliance Matrix] [CDRL: Compliance Matrix] [CDRL: Updated Compliance Matrix]

4. Demonstrating Compliance with Functional Requirements

The SI shall verify that the System addresses the needs and behaviors of all expected Users (as described in the Contract Standards) through Use Case analysis and functional testing.

4.1 Use Case Analysis

- 4.1.1 The SI shall develop and maintain a comprehensive set of use cases describing a representative range of typical and atypical scenarios from the user's and MBTA's perspective as a sequence of interactions with the System in accordance with all requirements specified herein. Use Cases shall be presented with narrative, tabular and diagram explanations.
- 4.1.2 The Use Cases shall demonstrate the SI's understanding of all Technical Requirements and explain interactions with and between System Elements, including all expected User Interactions. In developing the Use Cases, the SI must leverage its experience in the transit sector, analyze complex scenarios where potential failures might be expected, and not be limited to examples alluded to in the Technical Requirements.
- 4.1.3 The Use Cases shall be sufficiently extensive to cover scenarios for all User populations and account for various combinations of the required System Elements (and their respective functionality), including:
 - 4.1.3.1 every Product;
 - 4.1.3.2 every Reduced Fare Group eligibility;
 - 4.1.3.3 every accepted payment method, including all Transaction Channels;
 - 4.1.3.4 every Mode of transportation;
 - 4.1.3.5 every Fare Policy rule (including Transfer Fares, Penalty Fares, Extension Fares, etc.);
 - 4.1.3.6 every Sales Channel;
 - 4.1.3.7 every form of Media; and
 - 4.1.3.8 every Device.
- 4.1.4 Exception Use Cases shall be included to test scenarios that will have a negative result. Exception Use Cases must account for, at a minimum, failures of System Elements, user misunderstanding, Fare evasion, Vandalism, MBTA Service Failures, and Alternate Paths.
- 4.1.5 The SI shall submit a first draft version of the Use Case analysis for MBTA review within sixty (60) days of the Effective Date. The SI shall further develop and revise the Use Cases as required to obtain MBTA review and approval of the Use Cases within one hundred twenty (120) days of the Effective Date. The SI shall provide updated Use Cases to the MBTA no less than annually.

[CDRL: Draft Use Case analysis] [CDRL: Use Case analysis] [CDRL: Updated Use Case analysis]

4.2 Test Script for Functional Testing

- 4.2.1 The SI shall develop a Test Cases: a script describing the conditions under which a tester will complete tests to confirm compliance with all requirements.
- 4.2.2 Any use of automated tests during functional testing must simulate expected User Interactions.
- 4.2.3 The Test Cases shall cover all Technical Requirements which specifically refer to a User or User behavior.
- 4.2.4 The Test Cases shall cover all expected User Interactions described in the Use Cases (described above).

- 4.2.5 For each Test Case, the SI shall identify the steps to be executed, success criteria, preconditions, expected number of iterations, and mapping to the Technical Requirements and Use Cases (where applicable) related to the test.
- 4.2.6 Test Cases shall include positive and negative tests for each Technical Requirement.
- 4.2.7 The SI shall submit a draft version of the test scripts for MBTA review within one hundred twenty (120) days of the Effective Date. The SI shall further develop and revise the test scripts as required to obtain MBTA approval prior to functional testing. Final test scripts shall be available to the MBTA ten (10) business days prior to each test.
[CDRL: Draft test script for functional testing] [CDRL: Test script for functional testing]

5. Demonstrating Compliance with Non-Functional Requirements

- 5.1 The SI shall prove compliance with all non-functional requirements through performance tests, inspections, certifications and demonstrations. These tests, inspections, certifications and demonstrations shall confirm that the System operates as described in the Technical Requirements including in terms of responsiveness and stability.

5.2 Performance Tests

Without limitation, performance testing shall include the following types of tests:

- 5.2.1 Environmental tests. Where Technical Requirements specify how System Elements shall function in different environmental conditions (including low light or cold temperatures, for example), the SI shall design and complete tests in these actual conditions.
- 5.2.2 Measurements. Where requirements specify a measurement such as time, weight, size, speed, the SI shall design and complete tests to confirm the standard has been met.
- 5.2.3 Security. The SI shall confirm that the System protects information as described in Appendix 3.1 and Appendix 3.1A.
- 5.2.4 Load and stress testing. The SI shall account for expected transaction volumes (accounting for current and future volume requirements described in Appendix 2.10, Appendix 2.8, and Appendix 4.7) and stress and capacity testing up to the scalability requirement specified in Appendix 3.1.
- 5.2.5 Execution of all automated processes. The SI shall test all Data transfers, reporting, financial reconciliation and management, auditing and monitoring of transactions, and External Interfaces. The SI shall test the Automated Monitoring Subsystem described in Appendix 4.6.
- 5.2.6 Reliability testing. The SI shall demonstrate continuous uptime of the System without any failures for twenty-four (24) hours a day for one (1) week in a manner that simulates expected User Interactions.
- 5.2.7 Website testing. The SI shall conduct tests for System Website performance, security, accessibility and browser and OS compatibility. The SI shall test the System Website across the browsers and operating systems listed in the browser and OS support matrix provided as a requirement of Appendix 3.8. Requirements for the System Website Digital Accessibility Audit are described in Appendix 2.9.
- 5.2.8 Connectivity. The SI shall demonstrate that all Technical Requirements for the Communications Network (as described in Appendix 2.5) and offline functionality (as described in Appendix 2.3 and Appendix 3) have been met.

5.3 Test Plans for Performance Testing

The SI shall document Test Plans that describe a detailed procedure for each performance test to be performed in each phase of testing. Test Plans shall include methodologies, success criteria and expected number of iterations. The SI shall submit a draft version of the Test Plans for MBTA review within one hundred twenty (120) days of the Effective Date. The SI shall further develop and revise the Test Plans as required to obtain MBTA approval prior to performance testing. Final Test Plans shall be available to the MBTA ten (10) Business Days prior to each test.

[CDRL: Draft Test Plans for performance testing] [CDRL: Test plans for performance testing]

6. Demonstrating and Improving Usability of the System

The SI shall conduct user testing to demonstrate usability of the System in the MO Physical Space described in Appendix 2.4 and shall incorporate usability improvements into the final design of all User Interfaces.

6.1 Inclusions

The SI shall conduct user testing on all User Interfaces, including:

- 6.1.1 Devices: All Variants of Customer-Facing Devices (Gates, Validators and FVMs), Gate transition approach and Inspection Devices.
- 6.1.2 Sales Channels: System Website, Retail Reload Locations, Fare Card Mobile Application, Customer Support Software, and all FVM Variants.
- 6.1.3 Media: Standard Fare Card, Temporary Fare Card, Custom Fare Card, Enhanced Fare Card, Mobile Fare Card, and Payment Cards, NFC Devices and wearables with a Contactless EMV Credential.

6.2 Timing and Iterations

- 6.2.1 The SI shall provide the user testing reports described in Section 6.6 during the Final Design Review.
- 6.2.2 The SI's Proposal shall account for two additional rounds of user testing during the Term to precede the rollout of any changes to User Interfaces which, subject to the reasonable review of the MBTA, will have a substantial impact on Users.
- 6.2.3 If SI rework to resolve non-compliance issues results in changes to User Interfaces which, subject to the reasonable review of the MBTA, will have a substantial impact on Users, the SI shall complete additional user testing. Any additional rounds of user testing required as a result of SI rework to resolve non-compliance issues shall be done at no additional cost to the MBTA and not from the allotment described in Section 6.2.2 above.

6.3 Test Subjects

- 6.3.1 The SI shall be responsible for test subject recruitment, coordination and compensation (if compensation is proposed as part of the SI's testing proposal). The SI shall coordinate outreach to prospective test subjects through the MBTA.
- 6.3.2 The SI shall recruit test subjects who are MBTA customers representative of the larger population of customers in their racial, geographic, socio-economic, education, age, language and ability diversity.
- 6.3.3 Test subjects shall be accompanied by people, animals (including service animals) and objects typical in the Transportation Network as further described in Appendix 2.3.
- 6.3.4 Test subjects shall include Groups and Group Administrators representing a range of the organization sizes and types described in Appendix 3.8 and Appendix 4.4.
- 6.3.5 The MBTA reserves the right to nominate test subjects.

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- 6.3.6 MBTA Personnel shall be included in the group of test subjects, but will be exempt from any compensation offered to test subjects.
- 6.4 Methodology
- 6.4.1 User testing sessions shall include representative tasks typical of the user's demographic, including Reduced Fare Group eligibility, preferred payment method and likely Product. Tasks shall be appropriate to the user's prospective role as Customer or Personnel.
- 6.4.2 Transactions during user testing shall be spread proportionately across Sales Channels and accepted payment methods in the degree initially set forth in the RFP.
- 6.4.3 Each task shall be evaluated based on the test subject's ability to complete the task, with any drop off point or difficulties noted in the user testing reports.
- 6.4.4 The test method shall be observational and avoid being obtrusive or instructional.
- 6.4.5 Tasks involving the System Website shall be included and completed using a variety of devices popular with customers, as identified in the browser and OS support matrix required by Appendix 3.8.
- 6.4.6 The SI shall provide cash (or a cash alternative if allowed in Appendix 2.4), Payment Cards, Media and desktop computers, tablets and phones for accessing the System Website for use during user testing.
- 6.5 Test Script for User Testing
- 6.5.1 The SI shall develop a test script describing tasks each test subject will be asked to complete. These task descriptions shall be written as they will be described to the test subject and shall describe a scenario that explains the task that the user wants to complete.
- 6.5.2 The user testing script shall include all explanations and instructions that will be given to test subjects.
- 6.5.3 The user testing script shall include questions aimed at quantitative and qualitative measurements of test subjects' satisfaction with the System.
- 6.5.4 The SI shall submit a draft version of the test script for user testing for MBTA review. The SI shall further develop and revise the Test Plans as required to obtain MBTA approval prior to user testing. Final test scripts shall be available to the MBTA thirty (30) days prior to each round of user testing.
- [CDRL: Draft test script for user testing] [CDRL: Test script for user testing]
- 6.6 User Testing Reports
- Within ten (10) days of each round of user testing, the SI shall provide a report and improvement plan to the MBTA.
- 6.6.1 The SI shall provide a report summarizing user testing including: task completion rates, responses to customer satisfaction questions, observed issues, reported issues/complaints, description and prioritization of issues identified and remedial actions. [CDRL: User testing report]
- 6.6.2 The SI shall analyze the issues identified in user testing and develop a usability improvement plan which considers both the Technical Requirements and the test subjects' feedback and proposes improvements.
- 6.6.2.1 Analysis shall include all of the data gathered during user testing as described above, an explanation of the user impact and consideration for what could be done differently.
- 6.6.2.2 Proposed improvements shall utilize the SI's industry expertise and draw on best practices from other transit systems.

- 6.6.2.3 Proposed improvements shall focus on changes that can be implemented within the System's current capability. Any proposed improvements that might result in an MBTA change shall be identified as such and include cost and time estimates.
- 6.6.2.4 The SI shall seek approval from the MBTA before implementing any changes recommended in the usability improvement plan.
[CDRL: Usability improvement plan]

7. Data Validation

The SI shall conduct testing to confirm that Product sale and Tap Data is accurately recorded, correctly charged and payment is reconciled across all reports and outputs.

- 7.1 Data validation tests shall be designed and conducted in a controlled environment separate from any other test or actual Taps to ensure accuracy in Data reporting.
- 7.2 The Data validation testing shall be sufficiently extensive to cover scenarios for all expected User populations and account for various combinations of the required System Elements, including:
 - 7.2.1 The back-up information requirements set forth in Appendix 4.2;
 - 7.2.2 The back-up Data requirements set forth in Appendix 4.5;
 - 7.2.3 The output requirements set forth in Appendix 3.7; and
 - 7.2.4 And broadly covering Products, Reduced Fare Groups, Account types, Credential types, Fare Policy rules (including Transfer Fares, Penalty Fares, Extension Fares, etc.), and Sales Channels.
- 7.3 Data validation testing shall include Fare calculation tests, including:
 - 7.3.1 The use of Data representing at least half of MBTA's typical daily transactions. Such Data shall be either simulated Data generated by the SI or actual Data from the legacy system provided by the MBTA.
 - 7.3.2 Processing of test Data in simulated real time, performing the Fare calculation required by Appendix 3.7.
 - 7.3.3 Production of all of the Fare calculation outputs described in Appendix 3.7.
 - 7.3.4 Repeat testing any time the SI makes a change to the System impacting Fare calculation.
- 7.4 Data validation accuracy will be measured against the Key Performance Indicators if the Technical Requirements do not indicate another specific measure for the particular Data being tested.
- 7.5 The SI shall submit a draft version of the Test Plan for data validation testing for MBTA review within one hundred twenty (120) days of the Effective Date. The SI shall further develop and revise the Test Plan as required to obtain MBTA approval prior to data validation testing. The final Test Plan shall be available to the MBTA thirty (30) days prior to data validation testing. [CDRL: Draft Test Plan for data validation] [CDRL: Test Plan for data validation]

8. Proposal

8.1 Testing Proposal

The Proposal shall include a testing proposal for MBTA's review and approval which shall include, at a minimum, the following:

- 8.1.1 Description of Tests to be Performed

- 8.1.1.1 The testing proposal shall include a full list of the tests, demonstrations and inspections that the SI will perform to demonstrate compliance with all requirements.
- 8.1.1.2 The testing proposal shall include a description of testing methods, standards, surveillance, direction and methods of observing.
- 8.1.1.3 The testing proposal shall include the sequence of the tests, test prerequisites, SI's personnel to be involved and a summary of their qualifications and duties, and the location of each test.
- 8.1.1.4 The testing proposal shall include a description of the SI's intended use of manual and automated tests.
- 8.1.1.5 The testing proposal shall include the number of transactions the SI intends to test and a rationale for this decision.

[PSR: Description of tests to be performed]

8.1.2 Approach to reporting and remediation.

The testing proposal shall describe, for each test, the test report format, including the method for reporting and summarizing the test results. The testing proposal shall describe the method and format of record keeping for the failures identified and corrective action procedures to be followed when failures and inaccuracies occur. [PSR: Approach to reporting and remediation]

8.1.3 Sample of Testing Documentation

A sampling of the Use Cases, Compliance Matrix, Compliance Reports, Remediation Plans, Test Plans, and Test Cases which the SI believes is a relevant and representative sample of the System's complexity shall be included in the Proposal, and shall be not fewer than 10 nor more than 25 pages. This must include an explanation of the methodology and standards used in developing the subset and a statement that the SI commits to applying identical standards in all other submissions required by this Appendix 2.16 throughout the Term. [PSR: Sample subset of testing Documentation]

8.1.4 User Testing Plan

The SI's testing proposal shall include a user testing plan. At a minimum, the user testing plan shall include:

- 8.1.4.1 A description of the number of test subjects, recruitment plan and specifications, recruitment and proposed compensation for test subjects.
- 8.1.4.2 A description of the user testing methodology, including procedures to govern the conduct of activity, surveillance, direction, and methods of observing and recording the pertinent data including handling of failures of equipment and inaccuracies of reports.
- 8.1.4.3 A sample test script, describing test tasks where a User is asked to complete transactions using a Fare Vending Machine and where a User is asked to Inspect a Credential using an Inspection Device.

[PSR: User testing plan]

[PSR: Testing proposal]

8.2 Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 2.16. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall

cover this requirement and the team experience requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.13, 2.14 and 5. [PSR: Proposer team experience: Implementation, expansion, DB oversight and testing]

APPENDIX 3

SYSTEM FUNCTIONALITY REQUIREMENTS

Table of Contents

Appendix 3.1 - Information Security and Integrity

1. Information Security Plan 1
2. Risk Management and Internal Controls 3
3. Encryption..... 6
4. Access Control 7
5. Logging 8
6. Intrusion and Data Loss Detection/Prevention 9
7. Virus Protection and Malicious Software 9
8. Handling of Incidents..... 9
9. Data Retention 11
10. Requests for Access to Data..... 11
11. System Integrity, Accuracy and Correctness Tolerance 12
12. Contingency Plan and Implementation 13
13. Subcontracting 13
14. Compliance Report 14
15. Data Destruction 14
16. System Composition 14
17. Experience..... 14

Appendix 3.1A - Data Privacy and Retention

1. General Requirements for Access and Retention..... 1
2. Data Classifications 2
3. Retention 2
4. General Data Access Restriction Levels (Not Aggregate Data or Depersonalized Data).4
5. Aggregate Data and Depersonalized Data 5
6. Access Restrictions for Depersonalized and Aggregate Data..... 6
7. Regional Transit Providers and Integrated Services 7
8. Optional User-Requested Services..... 7
9. User-Requested Early Data Deletion and Destruction..... 8
10. Privacy Approach Submittal 8
11. Experience..... 8

Appendix 3.1B - Federated User Identity

1. General Requirements..... 1
2. Shared Data 2
3. User Experience 2
4. Integrations 3
5. Experience..... 3

Appendix 3.2 - Reader Processing and Media Acceptance

| | |
|---|---|
| 1. Software Architecture and Reader Standards | 1 |
| 2. Reader Performance | 4 |
| 3. Reader Auditability | 5 |
| 4. User Feedback and Host Device Integration..... | 6 |
| 5. Existing System | 7 |
| 6. Experience..... | 7 |

Appendix 3.3 - Credential Acceptance

| | |
|--|---|
| 1. Contactless EMV Credential Acceptance | 1 |
| 2. Fare Card Media Acceptance..... | 2 |
| 3. Alternate Media Acceptance..... | 2 |
| 4. AFC 1.0 Media Acceptance..... | 2 |
| 5. Card Detection and Activation..... | 2 |
| 6. Experience..... | 3 |

Appendix 3.4 - Reader Credential Authentication and Authorization

| | |
|--|---|
| 1. Authentication..... | 1 |
| 2. Authorization | 2 |
| 3. Offline Risk Management..... | 2 |
| 4. Local Velocity Controls and Passback..... | 2 |
| 5. Experience..... | 3 |

Appendix 3.5 - Credential Risk Management, Fraud Prevention, and Velocity Controls

| | |
|--------------------------|---|
| 1. Risk Management | 1 |
| 2. Fraud Prevention..... | 2 |
| 3. Fraud Reports..... | 4 |
| 4. Experience..... | 4 |

Appendix 3.6 - Electronic Payment Processing

| | |
|---|---|
| 1. General..... | 1 |
| 2. Tap Payments Processing | 2 |
| 3. Debt Recovery | 3 |
| 4. Fare Vending Machine Payments | 4 |
| 5. Web Payments | 5 |
| 6. Customer Support Software Payments | 5 |
| 7. Experience..... | 6 |

Appendix 3.7 - Fare Policy and Fare Calculation

| | |
|--|---|
| 1. Inputs | 1 |
| 2. Fare Calculation Process and Risk Management..... | 4 |
| 3. Outputs..... | 7 |

4. Experience.....8

Appendix 3.8 - Account Management

1. Accounts1
2. Profiles3
3. Account Types3
4. Groups.....6
5. Account Management Features.....7
6. Account Management Interfaces14
7. Account Data Timeliness Standards20
8. Experience.....22

Attachment 1: MBTA.com Website Analytics

Appendix 3.9 - Application Programming Interfaces

1. General API Requirements1
2. Integrated Services APIs.....2
3. Reader APIs6
4. Account Management Functionality APIs7
5. Location Data API8
6. Experience.....8

Appendix 3.10 - External Interfaces

1. MBTA Published Interfaces.....1
2. Custom Interfaces to MBTA Information Systems1
3. Experience.....3

APPENDIX 3.1

INFORMATION SECURITY AND INTEGRITY

The SI and each SI Person that provides, maintains, accesses, performs services and/or works on the System, shall comply with or exceed all applicable requirements of any Privacy Laws and the applicable Contract Standards related to privacy. Such compliance shall include the protection of the System and any and all Data, Personally Identifiable Information, System Elements and the ongoing operation and functionality of the System from all threats, whether internal or external, deliberate or accidental and shall implement technical, administrative, procedural, physical and organizational controls, policies, and associated procedures, and other necessary security oriented safeguards in accordance with privacy-by-design principles.

The Proposal shall address the Technical Requirements set forth in this Appendix 3.1 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Information Security and Integrity general approach]

As a part of, and in no way or manner in limitation of the SI and each SI Person's obligations, the SI and the System will comply with the following requirements, and its Proposal shall include provisions that address the requirements of this Appendix 3.1.

1. Information Security Plan

- 1.1 The SI shall implement and maintain and/or exceed administrative, physical, technical and organizational security measures, systems, safeguards and/or controls set forth herein, or incorporated herein by reference in a written Information Security Plan to reasonably mitigate security and privacy risks to the System, including its infrastructure, networks, payment processing services, Data, PII, and/or all other System Elements.
 - 1.1.1 In general, the Information Security Plan shall include appropriate administrative, technical, physical, organizational, and operational safeguards and other security measures designed to:
 - 1.1.1.1 Ensure the security and confidentiality of PII, payment processing services, PSP services, Data, Account Data and all other System Elements;
 - 1.1.1.2 Protect against any anticipated threats or hazards to the security and integrity of PII, Payment Processing Services, Data, Account Data and all other System Elements;
 - 1.1.1.3 Protect against any Incident; and
 - 1.1.1.4 Protect against the use of the System Website, System Elements, the System, or the website or other systems of the SI or any SI Person owned system(s) as a portal for unauthorized access to any other systems of the MBTA and any MBTA Person.
- 1.2 At a minimum and without limitation, the Information Security Plan shall fully address and include:
 - 1.2.1 How the System will ensure that the Information Security Plan is as effective as or exceeds all current and applicable Privacy Laws and industry standards, referenced herein or reasonably known and applied under Good Industry Practice, including PCI-SSC standards, NIST standards, and Commonwealth information security policies and standards. Failure

- to expressly identify herein an applicable law does not obviate the SI's responsibility for its implementation and adherence;
- 1.2.2 A description of the administrative, physical, and technical safeguards in place to ensure compliance with all Applicable Law related to the collection, processing, storage and transmission of User PII and Data;
 - 1.2.3 How the SI will operationalize the results of the risk assessment (as described herein) by fully addressing how each threat and task will be managed;
 - 1.2.4 How compliance with all required standards (including all Payment Industry Standards) will be sustained, monitored, and verified;
 - 1.2.5 What tasks and monitoring will be performed and at what intervals to sustain, maintain and verify compliance;
 - 1.2.6 Documentation and demonstration of compliance with Privacy Laws and standards, including those identified herein and in Appendix 1;
 - 1.2.7 Mandatory ongoing training of any SI Person and other authorized persons who have access to PII and Data regarding the privacy, confidentiality, and information security requirements set forth in this Project Agreement;
 - 1.2.8 Documentation and demonstration of NIST Special Publication 800-61 (using the latest revision for each update of the Information Security Plan) compliance for Incident detection, identification, response, and notification, including mandatory notification to the MBTA promptly and in accordance with Section 8.1.1 below;
 - 1.2.9 Application and use of internationally recognized security and PII standards whenever relevant standards exist and apply;
 - 1.2.10 Documentation and demonstration that the SI and each relevant SI Person has read, will adhere to, and certifies compliance with Massachusetts Executive Order No. 504, An Order Regarding the Security and Confidentiality of PII, with the understanding that:
 - 1.2.10.1 The relevant SI Person shall be substituted in place of any reference to or role of "Agency" or "Secretariat" in such Executive Order (or any iteration thereafter), and
 - 1.2.10.2 The MBTA shall be substituted in place of any reference to or role of "Enterprise Security Board", "ESB" or "Information Technology Division".
 - 1.2.10.3 Web address: <http://www.mass.gov/anf/research-and-tech/policies-legal-and-technical-guidance/legal-guidance/privacy-and-security/exec-order-504/>
 - 1.2.11 Compliance with the information security policies and standards promulgated from time to time by the Commonwealth Chief Information Officer and available online at the web address below, with the understanding that:
 - 1.2.11.1 The relevant SI Person shall be substituted in place of any reference to or role of "Agency" or "Secretariat" in such policies and standards, and
 - 1.2.11.2 The MBTA shall be substituted in place of any reference to or role of "Information Technology Division" in such policies and standards.
 - 1.2.11.3 Web address: <http://www.mass.gov/anf/research-and-tech/cyber-security/security-for-state-employees/security-policies-and-standards/>;
 - 1.2.12 Compliance with applicable NIST Special Publication 800-53 (Security and Privacy Controls) and FIPS Publication 200 standards;
 - 1.2.13 The access control, logging, and anti-virus solutions (as defined later in this Appendix 3.1) proposed for use by the SI;
 - 1.2.14 Explanation of how the Configuration and Change Management process (described in Appendix 4.3) will coordinate with the Information Security Plan to ensure that no enhancement, modification, patch, Update, or Upgrade to the System will result in a degradation or reduction of functionality or effectiveness of any of the security controls specified herein; and

- 1.2.15 The MBTA’s ability to, at any time after the first anniversary of the Revenue Service Commencement Date, conduct a data security audit to benchmark the SI’s then-current data security practices against the best practices of leading providers of services that are the same as or similar to the System.
- 1.3 The MBTA shall have the right of audit described in Section 1.2.15 above, and if any such audit reveals that the data security practices and processes utilized by SI are not at the level of Good Industry Practice, then the Parties will review the results of the audit and the SI shall promptly establish and implement a plan to implement changes to bring SI data security practices into compliance with Good Industry Practice.
- 1.4 To the extent that there are two or more conflicting security standards imposed under this Appendix 3.1, the SI shall identify such standards and propose which standard the SI will implement to ensure compliance with all requirements of this Appendix 3.1.
- 1.5 Within thirty (30) days of each revision of the risk assessments required hereunder, the SI shall update the Information Security Plan and submit such updated plan, together with updated reports demonstrating the Information Security Plan compliance with the results of the relevant risk assessment. [CDRL: Updated Information Security Plan] [CDRL: Information Security Plan Compliance Reports]
- 1.6 Timing
- 1.6.1 A sample Information Security Plan representative of what the Proposer intends to employ for the Project shall be included in the Proposal. [PSR: Sample Information Security Plan]
- 1.6.2 A proposed Information Security Plan specific to the Project shall be submitted for MBTA’s reasonable review and approval within six (6) months of the Effective Date, and shall be subject to Design Review as described in Appendix 7. [CDRL: Information Security Plan]
- 1.6.3 Until such time as the Information Security Plan is approved, the SI shall comply with the Information Security Plan included in Appendix 6 or standards consistent with Good Industry Practice, whichever is more comprehensive.

2. Risk Management and Internal Controls

- 2.1 Risk Assessment
- 2.1.1 The SI shall carry out and maintain a risk assessment in accordance with the NIST Special Publication 800-30 (current as updated), which also addresses the most current Open Web Application Security Project (OWASP) “Top 10 Application Security Flaws” and Common Vulnerability Scoring System (CVSS).
- 2.1.2 The scope of the risk assessment shall include the entire System, including any interconnection/interface with Accounts, System Users, Personnel, third party networks, System Elements, and service providers and/or other internal and external, physical and/or digital threat vulnerabilities.
- 2.1.3 Timing of Risk Assessments
- 2.1.3.1 The SI’s Proposal shall include an initial risk assessment. [PSR: Initial risk assessment]
- 2.1.3.2 The SI must update the risk assessment at least thirty (30) calendar days prior to the Installation Commencement Date and submit it to the MBTA. [CDRL: Updated risk assessment]

- 2.1.3.3 The SI must update the risk assessment at least once every two years from the Installation Commencement Date and within 30 calendar days of the following events (whichever occurs earlier or more frequently):
 - 2.1.3.3.1 Finalization of a PCI-SSC Report on Compliance (ROC).
 - 2.1.3.3.2 Identification of an Incident, including any Incidents defined by NIST Special Publication 800-61 (using the latest revision as of each update of the risk assessment) as a computer incident.
[CDRL: Updated risk assessment]
- 2.2 SOC 2 / ISO 27001/27002
 - 2.2.1 The SI shall maintain: (a) a Service Organization Control 2 Type II (“SOC 2”) report (or any successor reports) for security availability, confidentiality, and privacy-related controls of the information processing and management systems (including procedures, people, software, Data, and infrastructure) used by an SI Person in processing Data; and (b) a ISO/IEC 27001/27002 certification or industry-standard successor report.
 - 2.2.1.1 The SI will promptly provide a copy of the SOC 2 report and ISO certification report to MBTA prior to Pilot Phase 1, and annually.[CDRL: Copy of the SOC 2 report and ISO certification report]
 - 2.2.1.2 The SI will promptly notify MBTA of any deficiencies identified in any reports. No SI Person is authorized to complete work on the System that is unable to confirm adherence to the applicable standards. [CDRL: Notification of non-compliance with SOC 2 and ISO certification]
 - 2.2.1.3 The SI will promptly address and resolve any such deficiencies to the extent necessary to comply with SI’s obligations herein, and shall notify the MBTA when any such deficiency is resolved. [CDRL: Notification of resolution of non-compliance with SOC 2 and ISO certification]
- 2.3 Payment Industry Standards and Compliance
 - 2.3.1 The SI shall implement, maintain and certify, at all times the most current security measures and safeguards consistent with and/or exceeding the applicable security standards issued by the PCI Security Standards Council (PCI-SSC), including the Payment Card Industry Data Security Standards (PCI-DSS) and the Payment Application Data Security Standards (PA-DSS). Section 2.3.3.1 below describes which PCI-SSC standards are considered applicable to the System. This shall apply where any System Element:
 - 2.3.1.1 Involves storing, processing, or transmitting payment account information, Data or PII of any Payment Card or any other cardholder;
 - 2.3.1.2 Enable other specific functionality to provide the System, the SI, any SI Person, the MBTA, any MBTA Person, or an RTP the ability to offer payment processing services; or
 - 2.3.1.3 Provides the System, the SI, any SI Person, the MBTA, any MBTA Person, or an RTP with services from a Payment Service Provider.
 - 2.3.2 The SI shall regularly monitor, evaluate, and update its continued PCI-SSC compliance in light of any risk assessment findings, changes to or new versions of all PCI-SSC standards, technology advances, changes to the System, internal or external threats so that the PCI-SSC compliance of the System remains current at all times.
 - 2.3.3 Qualified Security Assessor (QSA)
 - 2.3.3.1 A PCI-SSC Qualified Security Assessor (QSA) engaged by the SI shall assess and determine:
 - 2.3.3.1.1 The applicability of relevant PCI-SSC standards to the System; and

- 2.3.3.1.2 The scope of the System to which the relevant PCI-SSC standards apply.
- 2.3.3.2 The QSA assessments and determinations shall be reviewed in strict compliance with PCI-SSC rules and guidance.
- 2.3.3.3 The QSA assessments and determinations shall be undertaken not less than annually and upon any significant change being made to the System.
- 2.3.3.4 The proposed QSA shall be identified as Key Personnel in the Proposal as a Proposer Team member on Proposal Form 2. [PSR: Qualified Security Assessor]
- 2.3.3.5 Any change to the QSA shall be subject to the Section 9.1(A) of the Project Agreement.
- 2.3.3.6 The SI shall deliver Documentation of each QSA assessment and determination to the MBTA. [CDRL: Documentation of QSA assessment and determination]
- 2.3.4 The QSA must certify and confirm that all APIs and interfaces related to the System and all other systems of the SI or third parties interacting with the System are compliant with the applicable PCI-SSC standards.
- 2.3.5 Certifications and Reports
 - 2.3.5.1 All PCI-SSC certifications upon which the System relies must be “valid for new deployments” as defined by the PCI-SSC at the time of the Proposal and at the time of each PCI-SSC Report on Compliance (ROC).
 - 2.3.5.2 The Proposal shall identify any existing PCI-SSC certifications upon which the System will rely. [PSR: PCI-SSC certifications]
 - 2.3.5.3 The SI shall maintain a document identifying and validating any PCI-SSC certifications upon which the System relies and make the document available to the MBTA at all times. [CDRL: PCI-SSC certifications]
 - 2.3.5.4 The SI shall provide copies of all ROCs and Attestations of Compliance (AOCs) prepared with respect to any component of the System determined to be in scope (as determined pursuant to Section 2.3.3.1 above) prior to the Installation Commencement Date and throughout the Term immediately upon receipt and immediately upon receipt of any updates to an ROC or AOC report. [CDRL: Copies of all PCI-SSC Reports on Compliance (ROCs) and Attestations of Compliance (AOCs)]

2.4 AFC 1.0 Media Security

To the extent the System accepts AFC 1.0 Media through a System Reader:

- 2.4.1 The System shall centrally secure existing AFC 1.0 Media key sets in secure hardware conforming to FIPS 140-2 Level 4 compliant hardware.
- 2.4.2 The System shall have a capability of distributing the keys encrypted to Readers using a fully Mutually Authenticated methodology. Readers must validate to the System that the keys have been received, decrypted and instantiated in secure Reader hardware ready for use.
- 2.4.3 The System shall have a capability of determining if the AFC 1.0 Media keys have been compromised and in such an event have the capability to:
 - 2.4.3.1 Actively monitor the use of AFC 1.0 Media to determine if there is fraudulent use.
 - 2.4.3.2 Prevent further use of specific AFC 1.0 Media using the compromised key where fraud has been detected.
 - 2.4.3.3 Prevent further use of all AFC 1.0 Media using the compromised key
- 2.4.4 The System shall be capable of generating and managing a hotlist of AFC 1.0 Media. The system shall have the capability to distribute this list securely to all Readers.

- 2.5 Personal Information/Personal Data Laws and Standards
 - 2.5.1 The System as designed, and the SI and any SI Person shall comply with all applicable Privacy Laws.
 - 2.5.2 PII/Data Mapping, Identification, Use, and Minimization
 - 2.5.2.1 In its Proposal, the SI must identify and describe any PII Data being, or anticipated to be, collected and stored by the System, the SI and/or any SI Person and the purpose(s) for such PII's collection. [PSR: Collection and storage of PII Data]
 - 2.5.2.1.1 Upon any update to the information provided in the Proposal regarding the identification, collection and/or storage of PII, the SI shall provide a written update explaining such changes to the MBTA. [CDRL: Collection and storage of PII Data]
 - 2.5.2.1.2 For purposes of the System, a ZIP Code is considered PII.
 - 2.5.2.2 The SI shall undertake all efforts to minimize or avoid unnecessary collection and/or use of PII Data in accordance with the Contract Standards.
 - 2.5.2.3 The SI shall use collect, process, retain, and delete User PII by, on, and/or through the System solely in accordance with and for the purposes of the operation of the System as defined by this Project Agreement.
 - 2.5.2.3.1 The SI must acknowledge that PII Data will be collected and used and ensure that access to PII will be restricted on a need-to-know basis.
 - 2.5.2.4 The SI shall ensure that any and all PII Data is transmitted, processed and stored (including Data at rest), on or offline, in encrypted form by using industry-accepted best practices, as further addressed Section 3 of this Appendix 3.1.
 - 2.5.2.5 The SI shall monitor on an ongoing basis all PII compliance.
 - 2.5.2.6 The SI shall destroy PII Data in the shortest time period possible, as legally permissible, in a manner consistent with the obligations and guidelines referenced herein or as provided by the MBTA, including those under Section 15 of this Appendix 3.1 and in Appendix 3.1A, without compromising the System functionality.
 - 2.5.3 The System shall be designed and operated to comply with federal and state laws and regulations pertaining to the collection of PII of minors/children (e.g. COPPA).
- 2.6 Cloud Computing Services
 - 2.6.1 For purposes of this Project Agreement, Cloud Computing Services shall be defined as any service used by or for the SI as part of the Project that meets the definition of “cloud computing” in NIST Special Publication 800-145.
 - 2.6.2 To the extent that the System makes use of any Cloud Computing Services, the SI shall complete and truthfully provide responses to the Cloud Security Alliance Consensus Assessment questionnaire (“CSA”) for each Cloud Computing Service, provide the responses in the Proposal and will complete an updated CSA for each Cloud Computing Service on an annual basis. [PSR: Completed Cloud Security Alliance Consensus Agreement questionnaire] [CDRL: Updated Cloud Security Alliance Consensus Agreement questionnaire]

3. Encryption

- 3.1 All encryption, tokenization, and hashing methods and uses in the System must be:
 - 3.1.1 Identified and described in Submittals before anything changes about the encryption, tokenization, and hashing methods uses in the System. Such description must include

- algorithm Documentation (or reference to a published document). [CDRL: Updated approach to using encryption, tokenization, and hashing methods]
- 3.1.1.1 The SI's Proposal shall identify and describe its approach to using encryption, tokenization, and hashing methods. [PSR: Approach to using encryption, tokenization, and hashing methods]
 - 3.1.2 Void of reliance on proprietary tools or algorithms.
 - 3.1.3 Capable of performing scheduled or emergency key rollover and retaining acceptance of old keys for Configurable timeframes.
 - 3.1.3.1 The SI's Proposal shall describe how this is accomplished and what adaptations will be implemented at any time that the System is modified, altered or changed. [PSR: Explanation of key rollover capabilities]
 - 3.1.4 Consistent with NIST Special Publication 800-57 and NIST Special Publication 800-131, each using the latest revision at the Proposal Submittal Date.
- 3.2 The SI shall use a certification authority and processes to ensure the integrity of all certificates and encryption used, in accordance with Good Industry Practice.
- 3.2.1 The SI's Proposal shall identify the authority and processes that he SI will use, including what expiration cycle will apply, and whether any service bureaus will be used in the process. [PSR: Certification authority identification and process]
- #### 4. Access Control
- 4.1 System shall ensure that each User of the APIs, Inspection Devices, and the Administrator Interface (defined in Appendix 3.8), including MBTA or SI Personnel, is assigned a unique user ID and password, token, or biometric identifier ("security keys"), and will allow access to Data only after authentication with valid security keys.
 - 4.2 The System shall provide, where applicable, Configurable security controls in accordance with Privacy Laws, Good Industry Practice, and the standards and laws referenced herein. Examples of security access controls include:
 - 4.2.1 the ability to revoke access after a defined number of consecutive failed login attempts ("lockout");
 - 4.2.2 the ability to specify the lockout time period;
 - 4.2.3 the ability to specify the number of invalid login requests before initiating the lockout;
 - 4.2.4 controls to ensure system-generated initial or reset passwords must be changed by the User upon first successful use;
 - 4.2.5 controls to force a password to expire after a defined period of time;
 - 4.2.6 controls to terminate a User Session after a defined period of inactivity;
 - 4.2.7 password history controls to limit password reuse;
 - 4.2.8 password length controls;
 - 4.2.9 password complexity requirements; and
 - 4.2.10 verification/authentication methods before resetting password.
 - 4.3 Access to Data by SI Personnel, MBTA Personnel, and RTP Personnel shall be limited to and based on the particular job role/responsibilities of the User in accordance with the requirements of Appendix 3.1A.
 - 4.4 Access to Account management functionality shall be limited to and based on the Configurations to the Administrator Group that the Administrator Account is part of, as described in Appendix 3.8.

- 4.5 Except as expressly provided in this Project Agreement, the SI shall not prevent an eligible User of a System Element, as applicable, from using such System Elements. Subject to this Section 4.5, the SI may prevent a User from using a System Element when that User has caused an Incident to occur or the SI reasonably expects that the User will cause an Incident to occur and has information to support that conclusion. The SI's conclusions regarding such risks shall be subject to reasonable MBTA review and approval, and such review shall not relieve the SI of its other obligations in this Appendix 3.1.
- 4.6 Any SI facility containing System Elements will implement appropriate facility access controls to ensure that only authorized personnel are allowed physical access to the facility.
- 4.6.1 Examples of facility access controls include: signage; identification badges and controlled access through a combination of badge and/or biometric verification; visitor sign in, escort, and sign out; around-the-clock security guards; and video surveillance.
- 4.7 The SI shall ensure appropriate security tools and services to monitor, manage, and enforce access control.
- 4.7.1 The SI shall be the responsible party for all System security tools and services including any system administration security keys, scanners, filters, event and Incident management platforms, penetration testing, and other security frameworks, tools and services.
- 4.7.2 Under no circumstance shall the SI or any SI Person provide or enable any access by the MBTA, any agent of the MBTA, and/or any Regional Transit Provider (whether intentional or unintentional, direct or indirect) to Data or functionality that is contrary to the Contract Standards. For example, the SI must keep control of all encryption keys and passwords used to manage the System's access control tools.
- 4.8 The SI shall provide a plan for access control within ninety (90) days of the Effective Date. [CDRL: Plan for access control]

5. Logging

- 5.1 The System will provide, where applicable, the following minimum logging capabilities:
- 5.1.1 Firewalls, routers, network switches and operating systems, will have their respective logging capabilities enabled, active, and configured to record, to their respective default logging destination or to a centralized syslog server (for network systems), event records in sufficient detail for diagnostic and analytical purposes in the event of an actual or suspected unauthorized access to or misuse of the System.
- 5.1.2 The System will record end user access log entries containing, at a minimum, the date, time, user ID, URL requested or entity ID operated on, operation performed (viewed, edited, etc.) and source IP address.
- 5.1.3 All required log records will be maintained for a minimum of ninety (90) days.
- 5.1.4 All required log records will be kept physically and virtually secured to prevent tampering.
- 5.1.5 Passwords/credentials will not be logged under any circumstances.
- 5.2 The SI shall, and shall cause each SI Person to, upon request by the MBTA provide to the MBTA copies of any log files reasonably requested to assist in the analysis or investigation of any actual or suspected unauthorized access or misuse of any System Element affecting the MBTA or an RTP. [CDRL: Log file of Data access]

6. Intrusion and Data Loss Detection/Prevention

- 6.1 The SI shall monitor the System for unauthorized access, interception, interruption, and Data loss using accepted industry-standard network-based intrusion detection or prevention mechanisms and Data loss prevention tools in accordance with Good Industry Practice.
- 6.2 The SI must isolate portions of the Communications Network to ensure that if an Internet-facing System Element suffers an intrusion or attack, the integrity of the remaining System Elements will not be compromised. The SI must therefore isolate portions of the Communications Network servicing Internet-facing System Elements from the following: all other Communications Network components of the System, all other SI networks, networks of the MBTA, networks of RTPs, and that of (if applicable) any other clients/customers of any SI Person.

7. Virus Protection and Malicious Software

- 7.1 The SI shall install and maintain ICESA Labs certified anti-virus Software and, to the extent possible, use real time protection features. The SI will maintain the anti-virus software in accordance with the anti-virus software vendor's recommended practices in order to prevent any System Element, service provider systems and/or the software services from being infected or affected by the presence of malicious software.
- 7.2 The SI shall ensure that the anti-virus software checks for new anti-virus signatures no less than once per day; and the related anti-virus signatures are current and no less recent than two versions/releases behind the most current version/release of the anti-virus signatures for the anti-virus software.
- 7.3 The SI, as relevant, shall immediately remove any malicious software discovered or which may be present in the System, and will perform real-time scanning on files and other Data uploaded into the System to identify and eliminate any files or other data containing malicious software.
- 7.4 Neither the System nor the SI will introduce or permit or facilitate the introduction into any MBTA Systems any software routines or element capable of causing or enabling unauthorized access to or intrusion upon, disabling, deactivating, deleting or otherwise damaging or interfering with any system, equipment, software, data, or network.

8. Handling of Incidents

- 8.1 Incident Response
In the event of any Incident, SI shall, at its sole cost and expense:
 - 8.1.1 Promptly (but in no case later than twenty-four (24) hours after the SI or any SI Person learns of an Incident) report such Incident to the MBTA, summarizing in reasonable detail the effect on any MBTA Entity and the Users, if known; [CDRL: Information security incident report]
 - 8.1.2 Investigate such Incident (in full cooperation with all MBTA Persons designated by the MBTA), perform a risk assessment, and develop a corrective action plan;
 - 8.1.3 Provide a written report to the MBTA of such risk assessment and action plan taken or to be taken by any SI Person; [CDRL: Information security incident risk assessment and action plan]
 - 8.1.4 Prepare and (following the MBTA's approval) implement a Remediation Plan to take all necessary and advisable corrective actions and cooperate fully with all MBTA Persons

- designated by the MBTA in all reasonable and lawful efforts to prevent, mitigate, rectify and remediate the effects of the Incident; [CDRL: Information security Remediation Plan]
- 8.1.5 Ensure that any report provided under Section 8.1.3 contains all information necessary to:
- 8.1.5.1 Conduct an appropriate legal analysis to determine compliance with all Applicable Law currently in effect and as they become effective (including Privacy Laws); and
 - 8.1.5.2 Determine the extent to which notification and communication to any persons or entities whose PII may have been disclosed or compromised as a result of the Incident (the “affected persons”) is advisable;
- 8.1.6 Make all SI Persons available for interview, as needed;
- 8.1.7 Mitigate, as expeditiously as possible and to the extent practicable, any harmful effect of such Incident that is known to the SI, including by employing commercially recognized consumer Data breach mitigation efforts such as the offering of credit monitoring for a period of at least twelve (12) months or such longer time as may be required by Applicable Law or any other similar protective measures designed to mitigate any damages to the affected persons;
- 8.1.8 Cooperate with all MBTA Persons designated by the MBTA in providing any filings, communications, notices, press releases or reports related to any Incident;
- 8.1.9 Ensure that the content of any filings, communications, notices, press releases or reports related to any Incident are approved by the MBTA prior to any publication or communication thereof;
- 8.1.10 If directed by the MBTA (acting reasonably), retain a call center or develop any internal or external communication materials in order to respond to inquiries regarding the Incident for a period of at least one hundred eighty (180) days or such longer time as may be required by Applicable Law; and
- 8.1.11 Replace all affected Fare Cards and Mobile Fare Cards, as and to the extent required under Appendix 2.6.
- 8.2 Incident Expenses
- Subject to Section 8.3, in the event of any Incident, the SI shall, in addition to complying with its obligations under Section 8.1 of this Appendix 3.1:
- 8.2.1 Be responsible for Deductions in respect of such Incident, as and to the extent provided in Appendix 8 (Payment Mechanism);
 - 8.2.2 Pay any resulting fines, penalties, levies, assessments, or other charges imposed by any Governmental Body or Payment Service Provider;
 - 8.2.3 Indemnify, defend and hold harmless the MBTA and any other Indemnified Party in accordance with Article 18 (Indemnification) from any Loss-and-Expense resulting therefrom.
- 8.3 Compensation Event Incidents
- In the event of the occurrence of an Incident described in Item (19) of the definition of Compensation Event, the SI shall take all response actions required pursuant to Section 8.1 of this Appendix 3.1, but shall be entitled compensation and relief from Deductions as and to the extent provided in Article 13 (Supervening Events) of the Project Agreement. In no event will the occurrence of any such Incident relieve the SI from its obligation to perform the response actions set forth in Section 8.1 of this Appendix.

8.4 Ransom

In the event that a ransom or similar payment is demanded, no ransom or similar payments shall ever be made by the SI or any SI Person.

9. Data Retention

9.1 The SI shall retain, maintain, store, possess Data and PII only for as long as there is a need to retain said Data and/or PII for the purposes for which it was collected and no longer than necessary for legal or business purposes, and in accordance with the requirements under Appendix 3.1A. Such retention periods must comply with legally mandated reporting, disclosure or other legal process requirements. Where deletion or destruction of Data or PII is impossible, the SI shall implement safeguards to ensure that the System shall render all copies such Data and PII inaccessible. The SI shall verify that policies and procedures are established for the disposal of Data and PII when no longer required for legal, regulatory or the specific business reasons for its collection.

9.2 Lost or Improperly Destroyed System Data

9.2.1 The SI will not delete or destroy any Data, PII or media on which Data or PII resides without prior authorization from the MBTA. MBTA will authorize the SI to delete or destroy Data and/or PII in accordance the document retention policies outlined herein or as otherwise directed by the MBTA in writing.

9.2.2 The SI will maintain and provide to MBTA one or more reports that identify the Data and PII, including Media, that has been destroyed and sanitized in a manner compliant with the Technical Requirements. [CDRL: Reports that identify the System Data that has been destroyed and sanitized]

9.2.3 In the event any Data is lost or destroyed due to any act or omission of an SI Person, including any Incident, the SI will restore such Data using the most recent available back-up. The SI will prioritize this effort to minimize any adverse effect upon the System, the MBTA, or use of the System Services by Users. The MBTA agrees to cooperate with the SI to provide any available information, files, or raw data needed for the regeneration, reconstruction, or replacement of the Data. If an SI Person fails to fully regenerate, reconstruct and/or replace any lost or destroyed Data within the time reasonably set by the MBTA, then the MBTA may, at the SI's expense, obtain data reconstruction services from a third party, and the SI will cooperate with such third party as requested by the MBTA. If it is determined that the Data has been lost or destroyed as a result of the willful, intentional, or negligent acts or omissions of an SI Person, the MBTA may pursue any and all civil and criminal actions available to it.

10. Requests for Access to Data

10.1 The SI shall hold any Data and/or PII in strictest confidence.

10.2 The SI shall not share, transfer, sell, or license, any Data or PII to any Third Party without the express written approval of the MBTA or as otherwise specified in this Project Agreement.

10.3 The System shall enable the reasonable identification, location, retrieval, correction, and/or processing of Data for such purposes including compliance with federal and state record keeping laws, access and correction rights, and the like.

10.4 The SI shall not use or disclose System Data or PII to any person or entity except as permitted or required in writing by MBTA. If required by a court of competent jurisdiction or any other Governmental Body to disclose such System Data or PII, SI will notify MBTA in writing prior to

any such disclosure in order to give MBTA an opportunity to oppose any such disclosure. [CDRL: System Data or PII disclosure notification]

- 10.5 Any work using, or transmission or storage of, Data or PII outside the United States is subject to prior written authorization by the MBTA.
- 10.5.1 The SI shall not, process, disseminate, or transfer any PII or Data outside the United States.
- 10.6 Only authorized SI Persons and/or certain MBTA employees, shall have access to Data and in accordance with the requirements under Appendix 3.1A and Section 5 of this Appendix 3.1.

11. System Integrity, Accuracy and Correctness Tolerance

11.1 System Facility Integrity

Any SI facility containing System Elements will, at a minimum:

- 11.1.1 Be structurally designed to withstand adverse weather and other reasonably predictable natural conditions;
- 11.1.2 Implement appropriate physical environmental safeguards to protect systems from damage related to smoke, heat, water, fire, humidity, or fluctuations in electrical power;
- 11.1.3 Be supported by uninterruptible power supplies and on-site backup power generating systems; and
- 11.1.4 Implement appropriate facility access controls, as described in Section 4 of this Appendix 3.1.

11.2 Accuracy and Correctness

11.2.1 Unless specifically defined otherwise whenever a requirement in this Project Agreement calls for “accurate” or “correct” calculations, reports, amounts, Fares, or other data (referred to here as “values”), it means that 99.999% of all values displayed, transmitted or charged to the MBTA or a Customer, per MBTA service day, must be precisely consistent (100%, zero tolerance) with the intended use of the value described in the requirement. Furthermore, in the interest of clarity, the following additional standards apply over and above the baseline standard just stated:

- 11.2.1.1 No more than 10 individual Fares (at the Trip level or equivalent level) charged each Operating Day may be other than precisely consistent as described above.
- 11.2.2 Once an inaccuracy is identified by either the SI or MBTA, the SI must act to prevent recurrence of the issue by finding and correcting the root cause. The timeliness of the resolution is defined in the Payment Mechanism (see Appendix 8).
- 11.2.3 If not specified elsewhere, all reports, displays, and values transmitted must be consistent internally (e.g. within each report) and collectively (e.g. a value appearing on one report must reconcile to the same value used in all other reports).

11.3 Scalability, Production System Reliability and Backup

- 11.3.1 All System Elements must be able to handle a 50% increase in volume and ridership over the Initial Term and a further 25% increase in volume and ridership over each Renewal Term.
- 11.3.2 The System shall be able to handle peaks in number of Users and transaction volumes due to Special Events or unanticipated situations.
- 11.3.3 The System Website shall be capable of supporting ten (10) times the MBTA’s current average daily traffic and sales transaction volumes without noticeable impact on the transaction speed. The SI shall expand the capacity of the System Website throughout the Term on an as needed basis in order to meet this requirement.

- 11.3.4 The Customer Support Software shall be capable of supporting ten (10) times the MBTA's current average daily usage with no noticeable impact to customer experience. The SI shall expand the capacity of the Customer Support Software throughout the Term on an as needed basis in order to meet this requirement.
- 11.3.5 The SI's Proposal shall describe its approach to scalability and specify any limitations. [PSR: Scalability approach and limitations]

12. Contingency Plan and Implementation

The SI's Proposal shall include a contingency plan. [PSR: Contingency plan]

- 12.1 The SI and any relevant SI Person will develop and implement a contingency plan that provides for continued operation in the event of a catastrophic event affecting a SI Person's business operations and which will be in accordance with NIST Special Publication 800-34, Commonwealth of Massachusetts, and internationally accepted business continuity, contingency and disaster recovery planning standards, procedures and practices, including:
 - 12.1.1 A disaster recovery facility that is geographically remote from its primary data center, along with all required System Elements sufficient to provide the System without substantial reduction or degradation of functionality or availability, in the event the primary data center were to be rendered unavailable;
 - 12.1.2 SI Persons shall notify MBTA as soon as possible after it deems a service outage to be a disaster and will address any such outage in accordance with the terms of its contingency plan and all applicable Contract Standards; [CDRL: Notification of service outage deemed disaster]
 - 12.1.3 Security control baselines are to be derived from the Contract Standards and presumed to be high-availability unless otherwise documented;
 - 12.1.4 Maximum tolerable downtime and recovery time objective are to be derived from Appendix 8; and
 - 12.1.5 "Recovery Point Objective" is defined as zero Data loss for User Interactions completed (from the perspective of the User, not the System) and up to one hour total data loss per year of the Term for everything not fitting in that prior category.
- 12.2 The contingency plan shall be updated and transmitted at least thirty (30) calendar days prior to the Installation Commencement Date, and updated at least once every three years thereafter. [CDRL: Updated contingency plan]
- 12.3 SI shall test all features of its contingency plan at least once per calendar year and will provide the results of such tests to the MBTA upon request. [CDRL: Contingency plan test results]

13. Subcontracting

The SI shall perform or cause to be performed sufficient due diligence prior to the retention of any Project Contractor or Subcontractor to ensure that such Project Contractor or Subcontractor will not, in any way, compromise the security, confidentiality, availability or integrity of any Data and/or the System. Further, the SI shall ensure that the terms of each Project Contract and Subcontract are sufficient to enable the SI to perform all of its responsibilities and obligations under this Project Agreement. Each SI Person performing any Contract Services shall be advised of and comply with the terms and conditions of all applicable Contract Standards, and the SI shall ensure that SI Persons are trained regarding their handling of the System and its Data and PII and obligations in accordance with Contract Standards.

14. Compliance Report

- 14.1 As part of each Monthly Performance Report, the SI shall provide a written and signed certification of the status of the compliance of the SI and the System with each of the following (the “Compliance Report”), including identification and explanation of any areas of noncompliance and the SI’s plans (and efforts to date) to Rectify those Performance Failures:
- 14.1.1 The standards and requirements set forth in Sections 2, 3, 4, 5, 6, 7, 9, 10, and 15 of this Appendix 3.1;
 - 14.1.2 The applicable Information Security Plan, including that the Information Security Plan is implemented as approved;
 - 14.1.3 All PCI-SSC standards in scope, as determined in accordance with Section 2.3.3.1, above;
 - 14.1.4 All Privacy Laws;
 - 14.1.5 That all Incidents have been reported to the MBTA;
 - 14.1.6 That the contingency plan set forth in this Appendix 3.1 is implemented as written; and,
 - 14.1.7 The requirements set forth in Section 13.
- 14.2 The MBTA shall be entitled to use any source or method permitted by this Project Agreement to assess compliance with the requirements referenced in Section 14.1, and shall not be limited to using the SI’s assertions in the Compliance Report.

[CDRL: Information security and integrity affirmation certification]

15. Data Destruction

Whenever the Project Agreement calls for the SI to permanently delete, destroy, or sanitize Data, the SI shall do so in accordance with the then most current version National Institute of Standards and Technology or (“NIST”) special publication 800-88 Guidelines for Media Sanitization.

16. System Composition

The SI’s Proposal shall include a detailed description of the System composition, and such description shall include the identification of all proposed COTS materials (e.g., Software, hardware and other portions), Open Source Software and proprietary materials that the Proposer intends to use to develop the System. [PSR: System composition]

17. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.1. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.5, 3.1B, 3.7, 3.8, and 3.10. [PSR: Proposer team experience: System capabilities and information security]

APPENDIX 3.1A

DATA PRIVACY AND RETENTION

The System and the SI shall safeguard all Data, including PII. In accordance with applicable Privacy Laws, including Commonwealth Executive Order 504 (“EO 504”), the SI is required to implement and maintain Data privacy and retention procedures and measures that meet or exceed the requirements of all Privacy Laws and Good Industry Practice to ensure the security, confidentiality, and integrity of the System and all PII and Data. This shall include strict compliance with the provisions, programs, guidelines, and policies addressed in this Appendix 3.1A.

Appendix 3.1A sets forth Data access and retention requirements for Data subsets. This Appendix 3.1A supplements, and does not supplant the requirements of Appendix 3.1.

1. General Requirements for Access and Retention

- 1.1 Design for privacy and security
Data and PII which can be protected and isolated to limit access only to the User must be so protected and segregated. Whenever the System can protect Data and PII through fundamental design, rather than business process controls alone, fundamental design protection is mandated.
- 1.2 Data concerning a User’s travel on Transportation Services (“Mobility Data”) shall only be used to:
 - 1.2.1 Implement Fare Policy,
 - 1.2.2 Support aggregated and depersonalized analysis for future/ongoing Fare Policy, service planning, and reporting, and
 - 1.2.3 Enhance customer service capabilities at the request of the User, and
 - 1.2.4 Comply with Applicable Law and orders of a court of competent jurisdiction to the extent the System contains Data which can be retrieved pursuant to the requirements set forth in this Appendix 3.1A.
- 1.3 Data about any Transaction Channel used by a User (including in respect of a Payment Card or any other method of payment) shall only be used to:
 - 1.3.1 Process payments,
 - 1.3.2 Enhance customer service capabilities at the request of the User, and
 - 1.3.3 Ensure compliance with PCI-SSC standards, as described in Appendix 3.1.
- 1.4 The System shall protect all other Data and PII to ensure a User’s financial accounts and identities are not divulged, altered, or misused, including compliance with the relevant provisions of Appendices 3.1, 3.5, and 3.6.
- 1.5 The SI shall clearly and conspicuously communicate Data and PII privacy and use policies for the System set forth in this Appendix 3.1A through the Account Management Interfaces, including disclosure and tracking policies, to Users, in plain language and only on the basis of what is needed, when it is needed and solely in the amount needed.
- 1.6 The SI shall ensure ongoing compliance with all Privacy Laws as they may be altered or amended from time to time.

2. Data Classifications

Classification for Data use and retention purposes will be as follows, and the System must be implemented in such a way as to allow Data use and retention to be defined and configured as set out in the Contract Standards.

Table 1: Data classifications

| | |
|---|---|
| [A] – Names and addresses | Includes physical, postal, and electronic (e-mail) addresses. Users must not be required to provide a name or address to travel. Users can choose to provide names and addresses for purposes set forth in this Project Agreement, such as for fulfillment of Media orders or to manage and make payments to Group Accounts. |
| [B] – Government identification numbers | Driver’s licenses or other government-issued identification may be requested during Inspections, and the identification numbers will be checked against lists of previously Inspected (and, if applicable, cited) identification numbers using a technical method (for example, one-way hashing) that ensures that the identification numbers are mathematically irretrievable. |
| [C] – Payment Card Data | Including Payment Card account numbers and account Data (including through Payment Services Providers) |
| [D] – Other Media identifiers | Identifying numbers associated with Fare Cards (accounts not covered by legal definition of PII) |
| [E] – Mobility Data | Including locations of Taps and specific Transportation Services used |
| [F] – Other sales and payment Data | Including purchased Products, Products and Stored Value used, and any Fare Policy applied in doing so (including Penalty Fares, etc.) |
| [G] – Reduced Fare Group eligibility | Request for, status of, and nature of eligibility of an Account to belong to a Reduced Fare Group |
| [H] – Inspection and violation Data | As described in Appendix 2.7 |
| [I] – Linked account numbers for Integrated Services | As described in Appendix 3.9; for example: parking, paratransit or bike sharing, at User request; must be stored using a technical method (for example, one-way hashing) that ensures that the linked account numbers are mathematically irretrievable, using a unique method for each Integrated Service. |
| [J] – All other non-PII System Data | Any Data not identified above; all PII shall be considered in one of the above |

3. Retention

- 3.1 PII must be permanently removed (destroyed) from the System after it is no longer needed, with such need defined as set forth by the Contract Standards and particularly this Appendix 3.1A, and the method for the destruction as set forth in Appendix 3.1.
- 3.2 Any change to the System and/or SI retention implementation must be agreed to in writing by the MBTA and, where appropriate, notice provided to the relevant Users.

- 3.3 Absent any MBTA authorized distinction and deviation, the following retention policies shall apply to Data existing in each Data classification:

Table 2: Data retention for Data existing in each Data classification

| Data classification | Retention period <i>(latest of each list applies)</i> |
|---|---|
| [A] – Names and addresses | Until all orders are fulfilled <i>and</i> Approximately thirteen to nineteen (13-19) months thereafter for Accounts that have used a Payment Card (Each Payment Card Organization has requirements for merchants to retain transaction documentation. Data can be retained up to one month beyond the respective Payment Card Organization requirements.) |
| [B] – Government identification numbers | Not stored in a retrievable fashion; hashes or similar implementations stored as allowed by applicable law (for example, Data retained to support application of progressive citations defined in M.G.L. Chapter 159, Section 101.42) |
| [C] – Payment Card Data | Approximately thirteen to nineteen (13-19) months after last use in connection with the System |
| [D] – Other Media identifiers | Approximately twenty (20) days after the last use in connection with the System <i>and</i> Approximately thirteen to nineteen (13-19) months if ever topped up with a Payment Card |
| [E] – Mobility Data | Approximately twenty (20) days after the Trip based on most current Fare Policy and Appendix 4.2. By way of example, if Fare Policy is implemented that provides incentives or discounts for patterns of usage over time, mobility Data may need to be retained longer, per Configuration. |
| [F] – Other sales and payment Data | Until each Product is used or expired and all debts are settled <i>and</i> Approximately thirteen to nineteen (13-19) months after last use of the Account if ever topped up with a Payment Card |
| [G] – Reduced Fare Group eligibility | Until Reduced Fare Group Eligibility has expired |
| [H] – Inspection and violation Data | As allowed by applicable law (for example, Data retained to support application of progressive citations defined in M.G.L. Chapter 159, Section 101.42), and as per MBTA Fare Policy |
| [I] – Linked account numbers for Integrated Services | Not stored in a retrievable fashion; hashes or similar implementations stored for approximately thirteen to nineteen (13-19) months after the last Integrated Services transaction for accounts that have used a Payment Card |
| [J] – All other non-PII System Data | The entire Term |

- 3.4 For Aggregate Data or Depersonalized Data across all Data Classifications, the retention period is the entire Term, and the System must shall the MBTA with access to all such Data throughout that period. The SI may implement an archiving scheme for Data older than twenty-four (24) months provided the MBTA retains access upon request; the archiving scheme shall be subject to reasonable MBTA review and approval.

4. General Data Access Restriction Levels (Not Aggregate Data or Depersonalized Data)

The following levels and those in Section 6 of this Appendix 3.1A make up the “Data Access Restriction Levels”:

4.1 Level 0 Data – Inaccessible

The System must ensure that these Data are not retrievable by anyone, and that the version of the Data stored may only be in the form of an irreversible, one-way hash or similar implementation.

4.2 Level 1 Data – User/Alternate Only

4.2.1 The System must ensure that only someone possessing one of the following pieces of information can access Level 1 Data:

4.2.1.1 The original Credential identifier (e.g. Fare Card or Payment Card number) used, or

4.2.1.2 A replacement Credential that was recorded in the User Account by someone who knew the original Credential identifier, or

4.2.1.3 Profile Account authentication information (e.g. username and password) created by someone who verified knowledge of the original Credential identifier.

4.2.2 The System must ensure that no “back door” means of access to Level 1 Data can be created or configured for the SI, for any SI Person, for the MBTA, or for any other private or government third party.

4.3 Level 2 Data – SI and Authorized User

4.3.1 Process restrictions and widely accepted standard encryption must protect Level 2 Data from loss, alteration, or misuse.

4.3.2 Access to the Level 2 Data must be restricted through technology and processes to only those Systems Integrator (SI) and MBTA Users, as further described herein, including employees, contractors, and vendors, who have a legitimate business or policy need associated with the System in order to:

4.3.2.1 Process the Data (including collecting revenue and fines, fulfilling orders, investigating fraud and disputes, responding to customer service inquiries), and

4.3.2.2 Respond to lawful requests for information.

4.4 Absent any MBTA authorized distinction or deviation (made at MBTA’s discretion), the access restrictions set forth in Table 3 shall apply (the superscript numbers correspond to the relevant Data Access Restriction Level) to each Data classification.

Table 3: Data access restrictions

| Data classification | Who can access | How it can be searched |
|--|---|---|
| [A] – Names and addresses | ② Systems Integrator and Other Authorized Users | Freely searchable by authorized Users, and linked with Data classified as [F] Other sales and payment, [G] Reduced Fare eligibility, and [H] Inspections and citations |
| [B] – Government identification numbers | ① Inaccessible (See Table 1, Data classification [B]) | Not stored |

| | | |
|---|---|--|
| [C] – Payment Card Data | When used directly for Tap: ① User/Alternate Only When used for Product subscription and automatic top-up: ② Systems Integrator and Other Authorized Users | Requires knowledge of full Payment Card number |
| [D] – Other Media identifiers | ① User/Alternate Only | Requires knowledge of full Media number |
| [E] – Mobility Data | For MBTA Personnel Accounts: ② Systems Integrator and Other Authorized Users For all other Accounts: ① User/Alternate Only | Requires knowledge of full Media number |
| [F] – Other sales and payment Data | ② Systems Integrator and Other Authorized Users | Freely searchable by authorized Users, and linked with Data classified as [A] Names and addresses, [G] Reduced Fare eligibility, and [H] Inspections and citations |
| [G] – Reduced Fare Group eligibility | ② Systems Integrator and Other Authorized Users | Freely searchable by authorized Users, and linked with Data classified as [A] Names and addresses, [F] Other sales and payment Data, and [H] Inspections and violation Data |
| [H] – Inspections and violation Data | ② Systems Integrator and Other Authorized Users | Freely searchable by authorized Users, and linked with Data classified as [A] Names and addresses, [F] Other sales and payment Data, and [G] Reduced Fare Group eligibility |
| [I] – Linked account numbers for Integrated Services | Existence of a linked account: ① User/Alternate Only Linked account numbers: ② Inaccessible (See Table 2 (I)) | Linked account numbers cannot be searched. With knowledge of the linked account number, the SI, an authorized User, or an Integrated Service can find an account by reapplying the technical method (e.g. hash). |
| [J] – All other non-PII System Data | ③ Controlled Research | Freely searchable |

5. Aggregate Data and Depersonalized Data

5.1 The System must implement aggregation and depersonalization of Data to enable Data analysis and reporting with sensitive Data and PII masked and modified so as not to be present in the resulting Data. The granularity of Data must be reduced in degrees to support a nuanced balance between privacy and Data utility to achieve the goals of this Project Agreement.

- 5.2 Three degrees of granularity reduction must be provided, and reporting Data and tools must take advantage of each.
- 5.2.1 With Persistent Depersonalized Identifiers
- 5.2.1.1 This is the lightest degree of depersonalization;
- 5.2.1.2 The structure and level of detail of the Data is not altered from the source; and
- 5.2.1.3 Any PII and other Media identifiers are randomly Obfuscated in a way that cannot be reversed, but which can be consistently analyzed over time to analyze an individual's Data.
- 5.2.2 With Transient Depersonalized Identifiers
- All persistent depersonalized identifiers conditions, except the Obfuscation does not yield consistent results for the same source Data over time. For example, "10 Park Plaza" would be altered to "982 Main Street" consistently only for up to one MBTA service day. Data for a different service day might be altered to "9010 Tea Tree Lane".
- 5.2.3 Aggregate Data
- Rather than altering Data to mask identity, the structure of the Data must be changed to summarize it to a higher level of abstraction, rather than altering the Data to mask identification. For example, rather than Data being available at the level of each individual User boarding of one Vehicle on one Trip, the Data might be rolled up into total figures for the entire Trip.

6. Access Restrictions for Depersonalized and Aggregate Data

- 6.1 Level 2 Data - SI and Authorized User
- As defined in Section 4.3 of this Appendix 3.1A.
- 6.2 Level 3 Data - Controlled Research
- 6.2.1 All Level 2 Data access restrictions are incorporated and apply to Level 3 Data.
- 6.2.2 In addition Data subject to Level 3 access restrictions may also be made available by the SI to the MBTA for analysis and research purposes by MBTA Persons or third parties designated by the MBTA (including analyzing User travel behavior and payment methods). [CDRL: Level 3 Data availability]
- 6.2.2.1 Any transfer, use, processing, collection, retention and deletion of Data for research purposes by the SI or any SI Person, must comply with the security requirements and Privacy Laws and obligations set forth in this Appendix 3.1A and in Appendix 3.1, as well as research-industry best practices and standards so long as such best practices do not contravene any Contract Standard.
- 6.3 Level 4 Data - Public
- 6.3.1 Level 4 Data may be shared in public Data sets and used in public reports. [CDRL: Level 4 Data availability]
- 6.3.1.1 This may be done by the MBTA or MBTA-authorized third party, without restriction.
- 6.4 Absent any MBTA authorized distinction or deviation (made at MBTA's discretion), the access restrictions set forth in Table 4 shall apply to each Data classification.

Table 4: Data access restrictions

| Degree class | With persistent depersonalized identifiers | With transient depersonalized identifiers | Aggregate Data |
|--|--|---|-----------------------|
| [A] – Names and addresses | ⑤ Controlled research | ③ Controlled research | ④ Public |
| [B] – Government identification numbers | ① Inaccessible | ① Not available | ① Inaccessible |
| [C] – Payment Card Data | ② SI and Other Authorized Users | ③ Controlled research | ④ Public |
| [D] – Other Media identifiers | ② SI and Other Authorized Users | ③ Controlled research | ④ Public |
| [E] – Mobility Data | ① Inaccessible | ③ Controlled research | ④ Public |
| [F] – Other sales and payment Data | ③ Controlled research | ③ Controlled research | ④ Public |
| [G] – Reduced Fare Group eligibility | ③ Controlled research | ③ Controlled research | ③ Controlled research |
| [H] – Inspections and violation Data | ③ Controlled research | ③ Controlled research | ④ Public |
| [I] – Linked account numbers for Integrated Services | ② SI and Other Authorized Users | ③ Controlled research | ④ Public |
| [J] – All other non-PII System Data | Not applicable | Not applicable | ④ Public |

7. Regional Transit Providers and Integrated Services

- 7.1 Pursuant to Section 12.3(B) of the Project Agreement, each RTP Contract shall provide for the same Data privacy, Data use, and Data retention requirements as are set forth in this Project Agreement.
- 7.2 Integrated Services must not have any access to User Data beyond that which the User specifies, as further described in Appendices 3.1 and 3.8.

8. Optional User-Requested Services

- 8.1 If any System functionality other than processing Taps, performing Fare calculation, and updating Account Data requires use of Data subject to Level 1 Data Restriction Access, that Data must only be accessible by the System for that System functionality if specifically authorized by someone meeting the criteria for Level 1 access stated in Section 4.2 above. That authorization, referred to here as “opting in”, shall:
- 8.1.1 Be specific to each piece of additional System functionality (beyond processing Taps, calculating Fares, and updating Account Data) that would use such Data, and
 - 8.1.2 Be revocable at any time by someone meeting the criteria for Level 1 access stated in Section 4.2 above and by the MBTA, and the System shall immediately upon revocation prevent any further use of the Data subject to Level 1 Data Restriction Access for the System functionality in question.

9. User-Requested Early Data Deletion and Destruction

9.1 Early Requests

- 9.1.1 Once the minimum retention conditions are satisfied but before deletion in the normal course of business occurs, authorized Users must be able to request the reasonable deletion of Data from the System, and the System must enable such reasonable requests, as further described in Appendix 3.1.
- 9.1.2 Where a User's request for the deletion or destruction of Data cannot reasonably be achieved (for example, where it is inextricably entwined with other Data, is necessary for System functionality, etc.) a response and explanation shall be provided to the User.

9.2 Archival Storage

- 9.2.1 Because system database backups are required for business continuity reasons, even Data removed from System may be stored in archival form for some time.

10. Privacy Approach Submittal

- 10.1 The SI's Proposal shall include a description of its approach to achieving the requirements of this Appendix 3.1A, including:

- 10.1.1 The Proposer's technical approach to the unique protections required for Mobility Data, including what encryption, hashing, and forward storage methods will be used.
- 10.1.2 The relevance of such an implementation to the Proposer's other current and future Users.
- 10.1.3 The Proposer's experience with the technical approach to be used to deliver their solution.
- 10.1.4 What features the Proposer will make available to provide access to Data for controlled research (for example, how the Proposer will create specific portals or otherwise make subsets of Data available for these purposes).
- 10.1.5 The Proposer's method and approach to Data aggregation and depersonalization.
- 10.1.6 Any information or experience the Proposer has that suggests that any Data needs to be retained in the System longer than outlined herein, and identify the business and/or legal need.
- 10.1.7 The Proposer's expected duration of backup archival and the process for managing those backups to protect User Data (both during and after retention periods and User requests for early Data removal).

[PSR: Privacy approach]

- 10.2 The privacy approach Submittal must be maintained throughout the Term, and any changes to it must be approved by the MBTA, in its discretion, before being implemented. [CDRL: Privacy approach]

11. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.1A. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. [PSR: Proposer team experience: Privacy]

APPENDIX 3.1B

FEDERATED USER IDENTITY

The System shall be designed to accommodate integration with federated User identity services (the “Federated Identity Services”) to enable a unified authentication credential for its Users across multiple MBTA applications, including the System. This integration may be in the form of a service offered by the SI, or through integration with a COTS product acquired by the MBTA. Neither implementation of nor integration with Federated Identity Services is part of the Contract Services, but demonstration of the capability of the System to support such a service (in accordance with the requirements in this Appendix 3.1B) is. The actual implementation of or integration with Federated Identity Services shall be an MBTA Change.

The Proposal shall address the Technical Requirements set forth in this Appendix 3.1B in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer’s proposed technical solution, based on an assumption that the SI will implement the Federated Identity Services through an MBTA Change.

The Proposal shall include a general explanation which describes how the Proposer’s approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA’s needs. [PSR: Federated User Identity general approach]

1. General Requirements

- 1.1 To the extent that Federated Identity Services are required to be implemented or integrated with:
 - 1.1.1 The Federated Identity Services shall offer integration capabilities compatible with industry standards to permit integration with a variety of MBTA applications. The MBTA prefers that the Federated Identity Services be implemented using a COTS solution that supports industry standards such as OAuth or OpenID Connect.
 - 1.1.1.1 The particular COTS solution chosen by the SI shall be identified in the Proposal. Alternatively, if the SI proposes to develop or implement its own solution, the Proposal shall include a description of how industry standards will be met and examples of where the solution is currently in use. [PSR: Federated Identity Services solution]
 - 1.1.2 The Federated Identity Services shall comply with the Authenticator Assurance Level (AAL) and/or Federation Assurance Level (FAL) identified in the Proposal throughout the Term.
 - 1.1.2.1 The Proposal shall describe which Authenticator Assurance Level (AAL) and/or Federation Assurance Level (FAL) will be met by the Federated Identity Services, as described in NIST Special Publication 800-63-3 (Digital Identity Guidelines) and 800-63C (Federation and Assertions). [PSR: Federated Identity Services assurance level]
 - 1.1.3 The Federated Identity Services shall enable authentication of Users by a single identity platform, while allowing for authorization of access across multiple MBTA applications.
 - 1.1.4 The Federated Identity Services shall enable centralized management of Profiles by the MBTA, and by the SI for Profiles of Registered Accounts, Administrator Accounts and the SI’s own access to the System.
 - 1.1.5 The Federated Identity Services shall not be enabled for Unregistered Accounts unless they are first converted to Registered Accounts (as described in Appendix 3.8).

- 1.1.6 The Federated Identity Services shall include the use of challenge questions and the option for multi-factor authentication, as described in Appendix 3.8. Challenge questions shall include options not related to Accounts to support use of the Federated Identity Services by non-System applications.
- 1.1.7 The SI shall be responsible for the creation and management of access credential Data for the System as described in Appendix 3.1 and Appendix 3.8. The SI acknowledges that ownership of such access credential Data, and the SI's use of the same, are governed by Article 16 (Intellectual Property Rights).
- 1.1.8 As part of the Handback Requirements, the SI shall promptly provide to the MBTA (i) copies of the access credential Data in a form and format reasonably requested by the MBTA, and (ii) all other support and assistance that the MBTA reasonably requests in order to ensure that the MBTA can seamlessly transition from the SI-provided Federated Identity Service to an equivalent, MBTA-identified service.
- 1.1.9 The Federated Identity Services shall support the initial creation of a Profile in the System as described in Appendix 3.8 using a social media account and subsequent linking of that Profile to enable logon using the social media account, so long as such an approach can be done in a manner compatible with the Privacy Laws, Appendix 3.1, Appendix 3.1A, and Good Industry Practice.
- 1.1.10 The design of the Federated Identity Services for both the System and other MBTA applications shall be subject to Design Review as described in Appendix 7.

2. Shared Data

- 2.1 To the extent that Federated Identity Services are required to be implemented or integrated with:
 - 2.1.1 Subject to the limitations set forth in Section 3 of this Appendix 3.1B, the Federated Identity Services service shall enable sharing of the following Registered Account Data with other MBTA applications:
 - 2.1.1.1 Name.
 - 2.1.1.2 Username.
 - 2.1.1.3 Contact details, including phone, email and address.
 - 2.1.1.4 Contact preferences.
 - 2.1.1.5 User Established Customizations, including language and Accessibility preferences.
 - 2.1.2 No other System Data shall be shared with other MBTA applications through the Federated Identity Services.
 - 2.1.3 All requirements of Appendix 3.1A apply to the Federated Identity Services, but to the extent the MBTA applications have access to the Data described in Section 2.1 of this Appendix 3.1B, the SI is not responsible for monitoring or controlling MBTA's further use of such Data.
 - 2.1.4 While some Data may be shared with the System from social media networks for the purpose of establishing a Profile as noted in Section 1.1.9 of this Appendix 3.1B, the SI shall not allow sharing of any Data from the System to social media networks.

3. User Experience

- 3.1 To the extent that Federated Identity Services are required to be implemented or integrated with:
 - 3.1.1 A User shall be able to enter one username, password or other authentication credential and gain access to multiple MBTA applications and the System;
 - 3.1.2 User access across applications shall be seamless and shall not require the User to log in more than once per session;

- 3.1.3 The Federated Identity Services shall allow the MBTA to Configurably give Users control and consent over which MBTA applications have access to their shared Profile data, what information will be transmitted, and, in the case where some information is optional for such purposes, the User shall have the ability to decide whether to transmit optional attributes to an MBTA application; and
- 3.1.4 A User shall have the ability to remove access to any application if desired.

4. Integrations

- 4.1 To the extent that Federated Identity Services are required to be implemented or integrated with:
 - 4.1.1 The Federated Identity Services shall be available for use by MBTA applications, including those developed and maintained by the MBTA and MBTA Persons. Examples of the MBTA applications which may use the Federated Identity Services include T-Alerts (http://www.mbta.com/rider_tools/t_alerts/), THE RIDE (<https://commerce.mbta.com/TheRide/>), MBTA.com, parking services, customer service/CRM, and mTicket (http://www.mbta.com/fares_and_passes/mTicketing/).
 - 4.1.2 The MBTA may add applications for integration with the Federated Identity Services throughout the Term. For example, the MBTA may begin by incorporating the applications that have the ability to integrate with the particular solution selected by the SI. Other legacy MBTA applications may not be integrated until a replacement system is put in place that has the ability to integrate with the solution. The SI shall support such a gradual rollout.
 - 4.1.3 The solution shall support MBTA applications hosted on different domains.
 - 4.1.4 The MBTA will be responsible for the integration of the MBTA applications with the Federated Identity Services, and the SI shall use all reasonable efforts to support the MBTA in connection with the technical integration, including providing developer support to MBTA Persons integrating MBTA applications with the Federated Identity Services.
 - 4.1.5 In the case of applications with an existing registered user base (not associated with a Profile created in the System), the SI and the MBTA will agree on a case by case basis for the approach around either migrating user accounts from the application or requiring users to re-register for the application once they have established a Registered Account, and the approach is subject to Design Review as described in Appendix 7.

5. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.1B. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.5, 3.1, 3.7, 3.8, and 3.10. [PSR: Proposer team experience: System capabilities and information security]

APPENDIX 3.2

READER PROCESSING AND MEDIA ACCEPTANCE

For purposes of this Project Agreement:

- The Reader is a Device that can interact with presented Media, process any Credential contained in or on such Media to generate Tap results, and provide those Tap results and other Data to Back-End System Elements and a “host device”, either a Customer-Facing Device or a device not provided by the SI (as required by Appendix 2.8 and Appendix 3.9).
- The System shall use Readers to interact with Credentials at Gates, Validators, Inspection Devices and other points of access to the Transportation Network.
- The Reader comprises System Elements including (i) one or more “points of presentment”, which generates the electromagnetic field in which Media is placed and Data is passed between them, (ii) the “application layer Software” (such as the EMV L2 Kernel), which may be hosted in the point of presentment, and (iii) a “Media processor” that processes the result of the interface between the Media and the point of presentment, to determine whether to permit or deny a Tap seeking access to Transportation Services. The Media processor may carry out point of presentment management, risk management, transaction Data construction, encryption and other security functions, may host the application layer Software (if such Software is not contained within the point of presentment), and may provide information to a host device sufficient to convey information to the User and communicate to other Back-End System Elements.
- One or more points of presentment will be connected to a single Media processor, and the Media processor connects to the host device.
- As stated in Appendix 2.3, Readers are not Customer-Facing Devices. Some requirements of this Appendix 3.2 are intentionally duplicative of Customer-Facing Device requirements in order to meet the MBTA’s goals for modular design, facilitate Handback Requirements, and support use of Readers in Expansion (as further described in Appendix 2.8).

The design of the Reader, including the Reader software architecture, security, monitoring, transaction processes and Reader performance shall be subject to Design Review as described in Appendix 7. The Proposal shall address the Technical Requirements set forth in this Appendix 3.2 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer’s proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer’s approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA’s needs. [PSR: Reader Processing and Media Acceptance general approach]

1. Software Architecture and Reader Standards

- 1.1 Readers must be capable of being fully compliant with all Reader requirements (in this Appendix 3.2 and elsewhere in the Contract Standards) throughout the Term. In addition, for those requirements identified as Reader Standards, the SI must make all Readers compliant at all times with any versions or updates to any specification or requirement referred to by the Reader Standards as they may be added or updated during the Term.
 - 1.1.1 The SI shall ensure Readers are capable of meeting the latest published software specifications and other requirements associated with the Reader Standards throughout the Term.

- 1.1.1.1 The Proposal shall present a plan to demonstrate how it intends to comply with the latest versions of such software specifications throughout the Term, and how the design of the Reader accommodates this plan. [PSR: Reader compliance plan]
 - 1.1.2 Except as provided in Section 13.8 of the Project Agreement in respect of a Change in Payment Industry Standards, the SI shall bear the cost and risk of any work needed to sustain compliance with Reader Standards, including software and configuration costs and risks.
 - 1.2 The Reader shall, at a minimum, comply with the following:
 - 1.2.1 ISO/IEC Specifications
 - 1.2.1.1 As part of the Reader Standards, the Reader shall comply with ISO/IEC 10373-6.
 - 1.2.2 Payment Card Organizations:
 - 1.2.2.1 As part of the Reader Standards, the Reader shall comply with Contactless EMV Level 1.
 - 1.2.2.2 As part of the Reader Standards, the Reader shall comply with the required Contactless EMV Level 2: application level specifications. The Reader must implement contactless acceptance of MasterCard, Visa, American Express and Discover.
 - 1.2.2.3 The SI may choose either to comply with EMVCo specifications, or with each Payment Card Organization's own specifications for Level 2.
 - 1.2.2.3.1 The SI must identify this choice in its Proposal. [PSR: Choice of Contactless EMV Level 2 specifications]
 - 1.2.2.4 As part of the Reader Standards, the Reader shall be fully contactless EMV compliant, supporting Offline Data Authentication according to the specific requirements of each Payment Card Organization identified in the requirement above.
 - 1.2.2.5 As part of the Reader Standards, the Reader shall comply with the merchant acquirer Level 3 test requirements as defined for each accepted Payment Card Organization.
- 1.3 Media Acceptance
 - 1.3.1 The Reader shall accept and process all Standard Fare Cards, Temporary Fare Cards, Custom Fare Cards, Enhanced Fare Cards and Contactless EMV Credentials.
 - 1.3.2 The Reader shall be capable of processing the Fare Card Credential when using the Mobile Fare Card.
 - 1.3.3 During the Pilots and the Transition Period, to the extent that Readers accept AFC 1.0 Media as defined in Appendix 3.3, the Reader shall be Configurably capable of accepting, authenticating and validating AFC 1.0 Media; Readers shall not have such capability after the Pilots and the Transition Period.
- 1.4 Security Standards

The SI's Proposal shall describe its approach to Reader security and protection. [PSR: Reader security and protection]

 - 1.4.1 The Reader shall only implement open security algorithms and cryptographic processes for the security of the Reader, and the transactional and handshake messaging between the Reader and the rest of the System. The SI shall not use proprietary methods of encryption or other security.
 - 1.4.2 As part of the Reader Standards, the Reader shall comply with the requirements of the PCI Security Standards Council (PCI-SSC). When updates to the PCI-SSC standards are

- published, the SI shall make all necessary Updates or Upgrades needed to meet the published compliance dates.
- 1.4.3 As part of the Reader Standards, the Reader shall be and remain compliant with applicable PCI-SSC standards, as defined by Appendix 3.1 and as deemed appropriate by the QSA. While the QSA engaged by the SI will ultimately determine the applicability of PCI-SSC standards to the System for the purpose of compliance (as defined in Appendix 3.1), the Reader Standards must include the relevant sections of the Payment Application Data Security Standards (PA-DSS) and Payment Card Industry PIN Transaction Security Point of Interaction (PCI-PTS POI) as well as the Reader's role in broader PCI-DSS requirements, in designing and maintaining the security of the Reader.
 - 1.4.4 As part of the Reader Standards, the SI shall ensure that cryptographic techniques employed in the design of Reader security processes reference global best practices established by NIST and the PCI-SSC.
 - 1.4.5 Any new Readers installed or provided during the Term must meet current security standards as defined by Appendix 3.1 and support all Media described in Section 1.3 of this Appendix 3.2.
 - 1.4.6 As part of the Reader Standards, the SI shall plan to meet the current security standards as defined by EMVCo, including extended key lengths and additionally plan to ensure the Readers are capable of meeting new cryptographic techniques published today by EMVCo with software updates only.
 - 1.4.7 The Reader shall connect to other System components in a secure manner. The Reader shall be Mutually Authenticated to the System before any further processing is carried out.
 - 1.4.7.1 The SI shall explain how this is accomplished in the Proposal, and how this method will ensure that unauthorized devices cannot masquerade as Readers. [PSR: Reader security and protection]
 - 1.4.8 The Readers shall be designed so as to prevent any unauthorized device from connecting to them without authentication.
 - 1.4.8.1 The SI shall explain how this requirement will be met in the Proposal, and explain how its chosen method will ensure that nothing but Credentials and System Elements can interact with a Reader. [PSR: Reader security and protection]
 - 1.4.9 The Reader shall implement protections to defend itself against physical and virtual attack.
 - 1.4.9.1 The SI shall take steps to prevent Readers from being subject to Payment Card skimming attacks using Good Industry Practice for protecting unattended payment terminals, including operational and physical security countermeasures and regular Device inspections.
 - 1.4.9.2 The SI shall identify all such protections in its Proposal. [PSR: Reader security and protection]
 - 1.4.10 During the Pilots and the Transition Period, to the extent that Readers accept AFC 1.0 Media as defined in Appendix 3.3, the Reader shall be capable of receiving and securing in tamper proof hardware the authentication keys for AFC 1.0 Media.
- 1.5 Network Communications:
- 1.5.1 The Reader shall maintain a secure, Mutually Authenticated connection with the Communications Network at all times, subject to Supervening Event relief as and to the extent provided in this Project Agreement.
 - 1.5.2 To the extent that an issue with the CN causes a Reader not to be compliant with any of the Technical Requirements, such Reader will not be considered to be operating in accordance with the Technical Requirements.
 - 1.5.3 The Reader must operate in such a way that Media and Credential acceptance will not be

- prevented due to any degradation in or loss of connectivity to the Communications Network.
- 1.5.4 The System shall be able to identify any Reader that loses its connection to the Communications Network and identify such Readers in the Automated Monitoring Subsystem, as further described in Appendix 4.6.
- 1.6 Reader Architecture
- 1.6.1 The SI shall design the Reader in such a way as to minimize the impact of future developments in the payments technology field on Reader subcomponents. The Reader architecture shall be subject to Design Review as described in Appendix 7. As examples of what the approach must address, at a minimum:
- 1.6.1.1 The Reader software must be designed in such a way as to isolate the processing of different Media types and Payment Card Organizations. The SI shall share the testing and certification schedule for the Reader with the MBTA throughout the Term, no less frequently than yearly. [CDRL: Reader testing and certification schedule]
- 1.6.1.2 The SI shall minimize the need to recertify all Payment Card Organizations as a result of a required upgrade as to one Payment Card Organization.
- 1.6.1.3 The SI must explain its approach to meeting the requirements of this Section 1.6.1 in the Proposal. [PSR: Approach to minimize impact of future payments technology developments]
- 1.6.2 All Readers shall remain synchronized with the rest of the System. Each Reader shall have an internally maintained time and date clock.
- 1.6.2.1 At all times, the Reader shall be synchronized with an authoritative time source shared by the rest of the System. Any variance from such authoritative time source shall be less than one (1) second.
- 1.6.2.1.1 The Proposal shall explain the time synchronization process and how it will work in various scenarios of System load, network traffic, and communications interruptions. [PSR: Time synchronization process]
- 1.6.2.2 Each Reader's internally maintained clock shall have drift less than or equal to 50 parts per million.
- 1.6.2.3 The clocks in all Readers shall be able to survive a power interruption of up to 48 hours without drift greater than allowed in Section 1.6.2.2.

2. Reader Performance

The Reader shall rapidly process Taps and quickly assess the risk of the presented Credentials, and the SI shall acknowledge and account for the criticality of this requirement to the safe operation of the MBTA network. Moving Users through the System is core to the MBTA's operation and as such the performance of the Reader plays an important role. More specifically:

- 2.1 As part of the Reader Standards, the Reader shall meet the Payment Card Organizations performance requirements for presented contactless payment credentials.
- 2.2 The Reader software shall be designed, implemented, maintained, and operated by the SI so as to result in Reader processing time of less than 100ms (not including Credential processing time), where the Reader processing time is measured from the moment of initial presentment by the User of a Credential to the Reader, to the moment of return of the result by the Reader to the host device (Validator, Reader, or API host).

- 2.3 The Reader shall process Fare Card transactions in less than 500ms, with a transaction time (Reader processing time + Credential processing time) measured from the moment of initial presentment by the User of a Credential to the Reader, to the moment of return of the result by the Reader to the host device (Validator, Reader, or API host).
- 2.4 The Reader shall remain in service while updates to Configurations and list data (if used) are made, except as allowed regarding preventative maintenance in Appendix 4.6.
- 2.5 Where the SI implements an update to Reader software or firmware, Readers shall remain in Revenue Service until the new software or firmware is hosted in the Reader and is ready for deployment. Deployment must be scheduled during periods of preventative maintenance as defined in Appendix 4.6, and such sequences must automatically activate to ensure timely activation of needed software or firmware, but while minimizing User impact.
- 2.6 The Reader shall be capable of returning to the immediately preceding software or firmware configuration should the new installation fail to perform to its specifications, and the SI must make use of this functionality as part of its overall maintenance and Configuration responsibilities.
- 2.7 The Reader shall be capable of reporting the current firmware, software and reader configuration versions it is running, among other attributes, through the Automated Monitoring Subsystem.
- 2.8 During the Pilots and the Transition Period, to the extent that Readers accept AFC 1.0 Media as defined in Appendix 3.3, the Reader shall have the capability of securely receiving and storing whitelist and hotlist Data for AFC 1.0 Media and checking each presented AFC 1.0 Media against this list; Readers shall not have such capability after the Pilots and the Transition Period.

3. Reader Auditability

The Reader and its interactions with Credentials and other System Elements shall be fully auditable and shall allow the SI to be able to investigate and report on issues as they arise throughout the Term, and to demonstrate the integrity of the Reader and the System to the MBTA. The Reader shall be capable of capturing and transmitting Data to implement this System requirement.

The SI must explain the auditing capabilities of the Reader, with examples, in the Proposal. [PSR: Reader auditing capabilities]

- 3.1 The Reader shall be capable of maintaining engineering logs and reporting Problems to the Automated Monitoring Subsystem. The SI must notify the MBTA when such engineering logging is enabled. [CDRL: Engineering logging notification]
- 3.2 The Reader shall datestamp and timestamp all individual Reader process steps to aid maintenance and reporting functionality, and collect and report these statistics in an aggregated or depersonalized manner (consistent with the requirements of Appendix 3.1A) through the Automated Monitoring Subsystem.
- 3.3 The Reader shall maintain or send for central maintenance a log of all interactions with presented Media and Credentials. This Tap record log shall contain at least the following information, but shall not include any PII and shall comply with the requirements of Appendix 3.1A.
 - 3.3.1 Media type
 - 3.3.2 Credential type
 - 3.3.3 Payment brand processed (if applicable)

- 3.3.4 Tap outcome (and reason)
 - 3.3.5 Tap processing time. This shall be defined as the time recorded at the start of the WUPA/WUPB/REQA/REQB immediately prior to the 1st response to polling command from a single card only and the time recorded at the later of: (i) the point when the Reader sets its LEDs and Audible cue to indicate an approve or decline and (ii) the point when the Reader returns Data to the host device.
- 3.4 The capabilities of Reader logging shall be Configurable whereby it shall be possible to Configure all or some logging through the Automated Monitoring Subsystem.
- 3.4.1 The minimum logging level which shall be maintained are the items defined in Section 3.3 above, less Section 3.3.5 Tap Processing time, which can be monitored through a Configuration change.

4. User Feedback and Host Device Integration

- 4.1 All System Elements used to fulfill requirements of Appendices 3.2, 3.3, 3.4, 3.5, and 3.6 shall be contained within and isolated to the Reader and other Back-End System Elements. For the avoidance of doubt, no PII shall be contained in any part of any Device other than the Reader.
- 4.2 All System Elements used to fulfill the requirements of Appendix 2.3 shall be contained within and isolated to the Customer-Facing Device and Back-End System Elements, and shall not be contained within a Reader, except that, subject to the requirements of Appendix 2.8 and Appendix 3.9 and this Section 4 of Appendix 3.2, display and audio feedback System Elements required by Appendix 2.3 may be contained within the Reader.
- 4.3 The SI shall design and implement the Reader such that it may be conveniently installed in a number of different host devices including the Customer-Facing Devices as described in Appendix 2.3 and other equipment as defined in Appendix 2.8 (“host devices”) that provide information to Users as to the result of a Tap, the processing of their Credential, or the status of the host device via audio, text displays, and other visual indicators.
- 4.4 Readers (or Variants thereof) must be able to operate as Back-End System Elements in the manner required by Appendix 2.8 and Appendix 3.9, interfacing with a host device and not relying on any integral display and audio System Elements. For the avoidance of doubt, this means that a Reader used for Expansion shall be capable of being installed and operating in a fare gate provided by a company other than the SI, and the Reader must be usable without any integral display or audio device.
- 4.5 The Reader shall be capable of relaying to a host device (and, if satisfying display or audio requirements integrally, meet all such requirements) information including the following:
 - 4.5.1 Reader status (such as in service, not in service, defect, and others),
 - 4.5.2 Indication of low and negative Account Balances on a Configurable basis,
 - 4.5.3 Text and graphical messages to the User in response to a Tap as set forth in the Technical Requirements,
 - 4.5.4 Activation of lights/LED configurations to display to the User to indicate Tap results or Reader status, and
 - 4.5.5 Generation of audio tones or messages to the User to indicate Tap results.

- 4.6 The Reader shall not store host device files used for messaging and status, but the Reader may be used as a communications channel to configure the host device if appropriate measures are taken to isolate sensitive data and PII, in accordance with Appendix 3.1.
- 4.7 Any audio visual feedback from the Reader to the User shall meet defined Accessibility and language standards as set forth in Appendix 2.9, whether through the Reader directly or from the Reader via a host device.
- 4.8 The Reader shall not send any PII (as described in Appendix 3.1A) to a host device.

5. Existing System

The SI shall design and implement the Reader in such a way as to permit it to coexist in the immediate vicinity of smart card processors in AFC 1.0 Equipment, as further described in Appendix 2.3.

6. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.2. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 3.3, 3.4 and 3.5. [PSR: Proposer team experience: Readers]

APPENDIX 3.3

CREDENTIAL ACCEPTANCE

The System shall accept two forms of Credential: the Fare Card (a closed loop Credential, which can only be used in the System) and Contactless EMV Credentials, issued by banks under the Payment Card Organizations American Express, Discover, MasterCard and Visa. The System shall accept either type of Credential via such Media as contactless cards, mobile NFC Devices, and wearables.

1. Contactless EMV Credential Acceptance

The System shall enable a User to present a Contactless EMV Credential directly to a Reader, which shall accept and process the User's Tap and grant such User access to Transportation Services.

- 1.1 At all times during the Term, the Reader shall be certified against the American Express, Discover, MasterCard and Visa Contactless EMV Credential specifications. It is the SI's responsibility to ensure certifications are maintained throughout the Term and that at no time, should Readers be operating without certification.
- 1.2 The Reader shall be capable of accepting two further EMV compliant payment brands without the need for additional or modified hardware.
- 1.3 At any time during the Term, the SI shall on request of the MBTA make all modifications necessary to the System to accept further EMV compliant Payment Card Organizations, via an MBTA Change.
- 1.4 The Reader shall only accept EMV capable Credentials that can be authenticated offline. No Magnetic Stripe Emulation (MSE) implementations for contactless cards shall be accepted at Readers.
- 1.5 The Reader must be able to accept contactless EMV general purpose reloadable (GPR) prepaid cards, and MBTA must have the ability to Configure whether or not to enable this capability and to what degree.
- 1.6 The Reader must have Configurable parameters on which Credentials to accept through BIN range or PAN blocking.
- 1.7 The SI shall design, implement, maintain, and operate the Readers in a manner consistent with the transaction model processes that relate to Reader processing, to implement and conform to Visa, MasterCard, American Express and Discover transit transaction rules at all times during the Term. See Appendix 3.2.
- 1.8 Contactless payment processing on the Reader shall not require the User to enter a PIN, provide signature verification, or otherwise take any action to verify the User's identity.
- 1.9 The Reader shall not print a receipt for the User. A record of the transaction shall be made available via Sales Channels (as described in Appendix 3.8) and Customer-Facing Devices (as described in Appendix 2.3).

2. Fare Card Media Acceptance

The System shall accept the closed-loop Fare Card Credential described in Appendix 2.6. This Fare Card Credential may also appear in Custom Fare Cards issued by businesses and universities that offer travel services to their employees or students (and similar use cases), as described in Appendix 4.4 and Enhanced Fare Cards used for MBTA Personnel Accounts, as described in Appendix 2.6.

- 2.1 The Reader shall process Fare Card Taps.
- 2.2 The Reader shall authenticate the Fare Card Credential offline without the need to verify the status of the Credential with the rest of the System in real time.
- 2.3 For each Tap, the Reader shall collect the Credential Identifier (C-ID) for Account processing.

3. Alternate Media Acceptance

Readers shall be capable of accepting Contactless EMV Credentials housed on mobile NFC Devices and Payment Cards.

- 3.1 Readers shall be capable of accepting Contactless EMV Credentials on NFC Devices from payment applications such as Apple Pay and Android Pay.
- 3.2 Readers shall be capable of accepting Fare Card Credentials on mobile NFC Devices.
- 3.3 Offline Authentication of the presented Credential (e.g. ODA) shall be performed by the Reader for NFC Device Taps.

4. AFC 1.0 Media Acceptance

- 4.1 The SI's Proposal shall identify to what extent AFC 1.0 Media will be accepted by Readers during the Pilots and the Transition Period, and must explain, if AFC 1.0 Media will not be accepted by Readers, how the SI will provide for an easily understood and successful experience for users of AFC 1.0 Media during the Pilot and the Transition Period. [PSR: AFC 1.0 Media acceptance]
- 4.2 If Appendix 6 indicates that AFC 1.0 Media will be accepted at Readers, then:
 - 4.2.1 During the Pilots and the Transition Period the System shall be capable of being Configured to accept legacy AFC 1.0 Media (1KB MiFare Classic with 4 byte non-unique identifier).
 - 4.2.2 The SI shall comply with the other Contract Standards relating to acceptance of AFC 1.0 Media, including those in Appendix 2.3, Appendix 3.2, and Appendix 3.4.
- 4.3 Regardless of what is said in Appendix 6 regarding AFC 1.0 Media, the System shall not accept AFC 1.0 Media after Transition Period Completion, except to comply with the balance conversion requirements of Appendix 4.4.

5. Card Detection and Activation

The Reader shall determine the supported application on the presented Media quickly to meet the User throughput standards described in Appendix 2.3. The Reader shall also detect and react to unknown Media and multiple presented Media and inform the User of this in a User-friendly manner as described by the requirements for the usability of messages on Customer-Facing Devices in Appendix 2.3.

- 5.1 The Reader shall be capable of interacting with all ISO 14443 compliant Media and determining

- which application on the presented Media to process.
- 5.2 The Reader must provide collision detection: If more than a single Media is detected in the Reader RF field, the Reader shall reject the Tap and request that a single Media is presented for processing. Suitable messaging shall be generated by the System to so inform the User.
 - 5.3 The Reader shall automatically determine the presented Media type and the correct communication protocols for the presented Credential.
 - 5.4 The Reader shall use standard contactless EMV application selection processes using the Proximity Payment System Environment (PPSE) application as first preference if supported by the card. Otherwise direct selection shall be used.
 - 5.5 Immediately following PPSE processing, the Reader shall select the payment application with highest Application Priority Indicator returned in the PPSE response from the card.
 - 5.6 If the Reader detects two or more payment applications with equal priority returned by the PPSE, the Reader shall select the application returned first in the PPSE response from the card.
 - 5.7 If direct selection is used, the order of presented payment applications shall be Configurable.
 - 5.8 Readers shall recognize and select the correct application for NFC Devices in the same manner as they do for any other payment Media.
 - 5.9 Readers shall recognize and select the correct application for the Fare Card.
 - 5.10 If the Reader detects an unsupported application (e.g. a fare card from another transit agency), it shall generate an alert and terminate processing indicating to Users the transaction has failed and the card type is not supported.
 - 5.11 The Reader shall make a record if the presented card is not currently accepted or if the presented card had failed processing, and make this data available for reporting by the MBTA and keep statistics in the Automated Monitoring Subsystem. [CDRL: Report on unsuccessful Taps]
 - 5.12 The acceptability of card Media and Credentials at the Reader shall be configurable according to Media type, Payment Card Organization, BIN range.
 - 5.13 Text, audio and other User messaging shall be consistent across all Credentials and Media accepted at the Readers.

6. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.3. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 3.2, 3.4 and 3.5. [PSR: Proposer team experience: Readers]

APPENDIX 3.4

READER CREDENTIAL AUTHENTICATION AND AUTHORIZATION

Upon presentation of a Credential via a Tap, the Reader shall authenticate the Credential and determine such Credential's validity by using Data returned by the Credential, the applicable Account information, and the System Configuration.

1. Authentication

- 1.1 In processing the presented Credential, the Reader shall authenticate all Media locally. The Reader shall possess the requisite configuration to authenticate the Credential locally, without online communication outside of the Reader (collectively, "Offline Authentication").
- 1.2 The SI shall determine the method of Offline Authentication of the Fare Card, but the implementation of such method of Offline Authentication shall be based on published methodologies for authentication of contactless Media.
 - 1.2.1 The SI's Proposal shall describe the method of Offline Authentication. [PSR: Authentication plan]
- 1.3 If a presented Contactless EMV Credential indicates support for fDDA or CDA (both ODA methods), but does not return authentication data, or the Reader is unable to verify the returned data, the Reader shall terminate the transaction and clearly indicate to the User that the Tap has failed.
- 1.4 The Reader shall reject a presented Contactless EMV Credential that does not indicate support for a valid ODA method. The list of supported ODA methods shall be Configurable.
- 1.5 The Reader shall perform local checks on the Data returned to ensure it is conformant. Such checks shall include Luhn, Bank Identification Number (BIN) range and expiry date checks.
- 1.6 The Reader shall include a method to block individual Credentials and ranges of EMV payment Credentials by BIN (IIN) number. The SI's approach shall balance the risk and cost of this capability with the policy imperative not to discriminate against unbanked and underbanked Customers using alternative financial products.
 - 1.6.1 The SI's Proposal shall include a description of the situations in which this capability will be used and how it may impact Users. [PSR: Risk management, fraud prevention and Velocity controls conceptual design]
- 1.7 If an Offline Authentication fails, the Reader shall decline the Credential, presenting a suitable message to the User.
- 1.8 The Reader shall be Configurable to communicate outside the Reader to make further checks as to the authenticity of the presented Credential.
 - 1.8.1 The SI's Proposal shall include a description of its approach to online authentication and the situations in which this capability may be used. [PSR: Authentication plan]
- 1.9 Offline Authentication shall be independently Configurable for each acceptable Credential.

- 1.10 During the Pilots and the Transition Period, to the extent that Readers accept AFC 1.0 Media as defined in Appendix 3.3, the Reader must be capable of identifying AFC 1.0 Media, selecting the appropriate application on the AFC 1.0 Media as agreed with the MBTA, confirming authenticity of the card, and checking for data on the AFC 1.0 Media indicating a valid travel entitlement. The method for doing so shall be subject to Design Review as defined in Appendix 7.

2. Authorization

- 2.1 The Reader shall accept or deny the Tap based on authentication results, applicable Account Data, and existing Configuration, including Fare Policy.
- 2.2 The Reader shall indicate feedback, such as host display of audio cues, or record of a Tap rejection in an Account, based on such Reader's determination to accept or deny the Tap.

3. Offline Risk Management

If connectivity to the Communications Network is lost for any reason, the Reader shall continue to allow Users access to Transportation Services in a manner equivalent to the manner in which the Reader provides access when connected to the Communications Network.

- 3.1 The Reader shall be capable of determining whether a presented Credential is eligible to provide a User access to Transportation Services in the event that there is no System connectivity.
- 3.2 Any loss of System connectivity shall not impact, nor shall be observable by, any User who presents a Credential to a Reader.
- 3.2.1 The SI's Proposal shall provide a description of the technical approach that will be used to comply with the requirements for offline risk management. Such description shall, among other things, include the description of any local Reader Data caching, and how such Data is used and refreshed. [PSR: Authentication plan]
- 3.3 The Reader shall be capable of continuing normal operation for up to fourteen (14) days without connection to the Communications Network.
- 3.4 The SI shall develop a method to allow Tap Data to be recovered manually from the Reader. The method shall maintain PCI-DSS requirements and meet the security requirements detailed in Appendix 3.1 and the other requirements set forth in Appendix 4.6.
- 3.5 For any Tap Data processed more than twenty-four (24) hours and two (2) Business Days after the end of the Operating Day on which the Trip for which the Tap took place, no increase in the computed Fare may be charged to the User, but any decrease in the computed Fare (for example, removing a Penalty Fare) shall be refunded to the User on the next Business Day after the new Data is processed. None of this changes the requirements of Appendix 4.2.

4. Local Velocity Controls and Passback

The System shall manage the control of Credentials being processed to ensure that compliance with MBTA Fare Policy regarding the association of Users and their Credentials is met.

- 4.1 The Reader shall be Configurable with the number of times a Credential may be used within a time period. Such time period shall also be Configurable.

- 4.2 Certain specially issued Credentials shall be able to pass through the Reader according to rules associated with such Credential, if so Configured by MBTA. These include, but are not limited to, Credentials issued to large groups and MBTA employees.
- 4.3 The Reader shall employ Anti-Passback Controls to prevent the passing back of a Credential to be used again at the same Station, or on the same Vehicle within a Configurable time period (set at 20 minutes unless and until overridden by Configuration or MBTA Fare Policy), and to ensure compliance with the Account Data Timeliness Revenue Protection Standards.
- 4.4 Anti-Passback Controls shall operate across all Gates in a Gated Station, Validators in an Ungated Station, and all Vehicle Validators. The SI shall ensure that transaction times are not impacted in the event of Communications Network or other failures.
- 4.4.1 The SI's Proposal shall (i) describe how this requirement will be achieved, (ii) provide technical details about how the Communications Network will be used, and (iii) describe how the SI will and shall ensure that transaction times are not impacted. [PSR: Cross-Device Anti-Passback Controls]
- 4.5 During the Pilots and the Transition Period, to the extent that Readers accept AFC 1.0 Media as defined in Appendix 3.3, the Reader shall employ Anti-Passback Controls for AFC 1.0 Media across all Readers in the same manner as required for a Fare Card.
- 4.6 The Reader shall provide information to its host Device sufficient to enable the Device to give indication to the User that a Tap is denied due to Anti-Passback Controls.
- 4.7 When a Tap on a Reader at a Gate is denied due to Anti-Passback Controls, the Gate shall prevent the User of the Credential accessing the Paid Area of a Station. The Reader will not reject a subsequent attempt to Tap within the time period of Anti-Passback Controls if the Tap is preceded by a Tap "out" including, for example, on the exit side of a Gate. However, the System will record any such occurrence in the User's Account and use it for Fare calculation purposes pursuant to the MBTA's right to Configure such use.

5. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.4. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 3.2, 3.3 and 3.5. [PSR: Proposer team experience: Readers]

APPENDIX 3.5

CREDENTIAL RISK MANAGEMENT, FRAUD PREVENTION, AND VELOCITY CONTROLS

The System shall ensure that funds are accurately and timely recovered for all Trips taken by Users, and shall reject all Taps by Users who have delinquent Accounts or who have failed to present a genuine Credential. The System shall provide Users who comply with the MBTA Fare Policy with immediate access to Transportation Services, while at the same time detecting and denying access to Transportation Services to Users who do not pay the correct Fare pursuant to Fare Policy. The System shall support controls and checks on Velocity.

The risk management, fraud prevention and Velocity controls described below shall be subject to Design Review as described in Appendix 7, and to Configuration rights thereafter. [PSR: Risk management, fraud prevention and Velocity controls conceptual design] [CDRL: Risk management, fraud prevention and Velocity controls preliminary design] [CDRL: Risk management, fraud prevention and Velocity controls final design]

1. Risk Management

- 1.1 The System shall manage the financial, reputational, and integrity risk of all forms of payment (including all Transaction Channels) and all Fare Card Credentials.
- 1.2 The System shall continuously and automatically determine the risk of various events, such as Taps from Readers, EMV Credential Authorization responses, Fare Card Enablements or cardholder denial reasons addressed via Customer Support Software or System Website (each a “Triggering Event”).
- 1.3 The System shall block or suspend further use of Contactless EMV Credentials or Fare Cards in the event of a failed Triggering Event. Failed Triggering Events include failed Authorizations, failed balance check, failed Velocity checks, or placement on a “hotlist” (as such term is defined by a Payment Card Organization or Configuration), subject in all cases to Fare Policy and Configuration.
- 1.4 The System shall provide and implement a mechanism which automatically re-instates a blocked or suspended Contactless EMV Credential or Fare Card Credential upon clearance of any outstanding debt to the associated Account and which supports compliance with the Account Data Timeliness Standards, subject to Configuration. The MBTA shall be able to Configure this automatic re-instatement process (including tolerance levels and lookback period).
- 1.5 The System shall take full advantage of Payment Card Organization rules to automatically recover funds from delinquent Accounts, store PANs and Fare Card numbers securely, and update any list as frequently as provided in Section 1.6 of this Appendix 3.5. This mechanism shall be Configurable by the MBTA in respect of factors including frequency, amounts (including partial recovery), and timing.
- 1.6 The frequency of any updates to lists (if used) shall be Configurable and shall be as frequent as needed to fulfill the Technical Requirements, including the Account Data Timeliness Standards.

- 1.7 The System shall include and employ a method to Configurably block individual Credentials, ranges of EMV payment Credentials by BIN (IIN) number, and other groupings of Credentials as are possible by reference to Good Industry Practice; such Configuration shall provide the SI and the MBTA the ability to customize application of blocking by parameters including Payment Card issuer, Payment Card type (including classes of prepaid debit card), Sales Channel, Transaction Channel, and other parameters within the capabilities of the System including as defined in Appendix 6. The SI shall leverage this capability to implement the other Technical Requirements in respect of risk and fraud management, and the MBTA's Configuration right shall permit the MBTA to both add to and remove from the SI's proposed and implemented configurations.
- 1.8 The Proposal shall include a description of methods that provide risk management functionality that complies with the requirements of this Section 1. The proposed methodology shall include descriptions of any technical approaches, including use of local cached Data, online Authorizations, and timeliness of the Data used in each step. The Proposal shall include specific information about the timings that will be used for the update of any lists. The Proposal shall describe the specific level and extent of parameterization capabilities of the System in respect of configuring risk and fraud management. The Proposal shall also demonstrate how it balances the following:
- 1.8.1 Maximizing Fare Revenue collection;
 - 1.8.2 Enabling Customer mobility while giving access to Customers who pay or are able to pay; and
 - 1.8.3 Correctly charging Accounts each and every time.
- [PSR: Risk management, fraud prevention and Velocity controls conceptual design]

2. Fraud Prevention

The System shall actively monitor and manage Taps, transactions, Accounts, and funds to detect and prevent fraudulent activities.

- 2.1 The SI shall augment the System's risk management capabilities using any restricted card lists (RCL) or hot card files (HCF) available from the Acquirer or other PSPs.
- 2.1.1 The Proposal shall present how, if used, RCL or HCF files will be used to in the System to manage risk. [PSR: Risk management, fraud prevention and Velocity controls conceptual design]
- 2.2 The System shall prevent the use of counterfeit or simulated Credentials.
- 2.3 The System shall actively monitor the use of Credentials to ensure that such use occurs within the constraints of Fare Policy.
- 2.4 The System shall restrict Credential usage which exceeds Velocity and risk thresholds as defined by Fare Policy and Configuration.
- 2.5 Credentials shall be assignable to a Configurable number of Users. Initially, this shall be set to one Credential per User, except in the cases described in the Technical Requirements, which include but are not limited to MBTA Personnel, first responders, and large Groups.
- 2.6 The System shall deny subsequent Taps for the same Credential used at the same Reader, Station or Vehicle within a Configurable amount of time, as further described in Appendix 3.4.

- 2.7 The SI shall update the configuration of Velocity controls throughout the Term and regularly present to the MBTA for approval. The MBTA shall also have rights to Configure additional Velocity controls throughout the Term. [CDRL: Velocity control configuration]
- 2.7.1 The MBTA shall, at its discretion, have the right to approve or deny any SI-proposed Velocity controls, and the MBTA's choices in this regard shall be considered Configuration.
- 2.7.2 Without limiting any Configuration right set forth in this Appendix 3.5, the SI shall propose, as part of Preliminary Design Review, the initial Velocity controls, and, prior to any Pilot, shall implement the approved Velocity controls. [CDRL: Velocity control configuration]
- 2.7.3 The Proposal shall include an initial conceptual Velocity control configuration and implementation. [PSR: Risk management, fraud prevention and Velocity controls conceptual design]
- 2.8 The System shall monitor the automatic renewal of Pass Products and automatic top-up of Value and ensure that Products are not issued without payment (or other satisfaction of Fare Policy requirements).
- 2.9 The System shall monitor for Credentials with unusual/high volumes of usage, abnormal usage patterns (including geographically impossible use, including, for example, multiple Taps from the same Credential within a period of time that would be physically impossible for a User to get from point A to point B using the Transportation Network), and restrict use of such Credentials as and to the extent called for by Fare Policy or Configuration. This process shall preserve the integrity of the privacy requirements described in Appendix 3.1A.
- 2.10 The System shall implement a Configurable Velocity control to limit the maximum number of Taps at one Station, on one Vehicle or on one Mode per Operating Day per Credential. Such Velocity control shall (i) be Configurable and set at ten (10) unless Configured otherwise by MBTA, and (ii) limit sale of Taps by members of Reduced Fare Groups and other Users at a station in violation of MBTA Fare Policy. This capability shall be Configurable for each Group or type of Account.
- 2.11 The System shall be capable of single and bulk permanent blocking or temporary suspension of any or all Accounts and Credentials associated with a certain employer, or based on other predefined standards related to a Group.
- 2.12 The System shall provide a Configurable set of parameters, compliant with MBTA Fare Policy, to restrict fraudulent Credential usage, including new parameters required to prevent fraud cases that emerge during System operation. Such parameters shall include a maximum number of Taps in a given period at one Station, for Stored Value (especially for Accounts that are part of a Reduced Fare Group) and Pass Products.
- 2.12.1 The Proposal shall describe a design that presents with sufficient details the parameters which will be used to restrict fraudulent Credential usage. [PSR: Risk management, fraud prevention and Velocity controls conceptual design]
- 2.13 The SI shall share Data in respect of suspected fraud with the MBTA continuously throughout the Term.
- 2.13.1 The Proposal shall describe the SI's mechanism for sharing fraud Data. [PSR: Risk management, fraud prevention and Velocity controls conceptual design]

- 2.14 The System shall regularly baseline the status of a Credential over its lifetime to determining whether use, reload, and travel patterns remain consistent. The System shall identify and shall, as and to the extent defined by Configuration, adjust acceptance parameters for Credentials that are associated with unusual characteristics such as regular small reloads or Taps within a short period of time that may indicate fraud or violations of MBTA Fare Policy.
- 2.15 For all Credentials and Accounts, the System shall continuously monitor unusual or unexpected travel patterns and other usage that could be the result of fraudulent activity. The SI shall implement continuous improvement in the System of the fraud prevention activities to identify new means of fraud not previously considered. Execution of additional automated fraud prevention countermeasures shall be subject to reasonable MBTA review and approval prior to implementation, and to Configuration rights thereafter.
- 2.16 During the Preliminary Design Review, the SI shall propose method(s) that will be used to accomplish the requirements of this Section 2 not addressed in the Submittal required in Section 2.7.2. The resulting plan shall be maintained by the SI throughout the Term. [CDRL: Plan for intelligent fraud monitoring]
 - 2.16.1 The Proposal shall include a description of the SI's approach to fraud monitoring and management. [PSR: Risk management, fraud prevention and Velocity controls conceptual design]

3. Fraud Reports

- 3.1 The SI shall provide technical assistance to the MBTA in fraud investigations. Such technical assistance shall include performing ad-hoc data analysis and sharing information on risk management Configuration and algorithms.
- 3.2 As part of the Monthly Performance Report, the SI shall produce reports for the MBTA on fraud issues, propose and discuss methods to address, and implement Configuration and specific Account and Credential acceptance changes upon MBTA approval. [CDRL: Fraud Reports]
- 3.3 The SI shall provide reports upon request and as part of the Monthly Performance Report on Credentials meeting the criteria described in Section 2.9 of this Appendix 3.5. [CDRL: Report on fraudulent Credential usage]
- 3.4 The SI shall provide a report upon request and as part of the Monthly Performance Report detailing changes to the acceptance or denial of specific Credentials, either applied automatically, or acted upon by a User. [CDRL: Report on changes to Credential acceptance]
- 3.5 The SI shall provide a report upon request and as part of the Monthly Performance Report that indicates the Accounts with, among other things, the greatest number of Taps, the greatest number of Penalty Fares, the greatest total spending, the greatest number of Trips, the greatest number of sales. [CDRL: Report on Account usage peaks]

4. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.5. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement

and the team experience requirement described in Appendix 3.2, 3.3 and 3.4. [PSR: Proposer team experience: Reader]

APPENDIX 3.6

ELECTRONIC PAYMENT PROCESSING

The System shall manage and implement electronic payment processing from all relevant System Elements, including Fare Vending Machines, the System Website, Customer Support Software, the Fare Card Mobile Application, APIs, and Taps received from Readers. The SI shall account for the fact that each payment environment is likely to require specific processes and standards to ensure payments are handled and processed securely, cost effectively and in a timely manner. The design of the transaction model and payment processing throughout the System shall be subject to Design Review as described in Appendix 7.

The Proposal shall address the Technical Requirements set forth in this Appendix 3.6 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Electronic payment processing general approach]

1. General

- 1.1 The System shall carry out payment processing in accordance with the standards set forth by each Payment Card Organization, and the SI shall update the System to ensure compliance with such standards at all times during the Term.
- 1.2 The System shall be certified to meet Acquirer certification according to the standards for each Payment Card Organization.
 - 1.2.1 The SI shall make available details of all certifications used in payment processing at all times throughout the Term. [CDRL: List of all System certifications]
 - 1.2.2 The Proposal shall identify what existing certifications the Proposer will rely upon. [PSR: Description of SI's Acquirer certifications]
- 1.3 For all Payment Card information held on file, the System shall utilize Acquirer information to update stored payment account details when the payment information changes, including card expirations, lost or stolen cards, upgrades or portfolio conversions.
- 1.4 The System shall use Acquirer or PSP services to ensure Primary Account Numbers (PANs) can be reconciled between those returned from NFC Devices and are matched with those printed on the Payment Card. These services may include tokenization solutions that will aid compliance with PCI-DSS and reduction of the scope of PCI-DSS compliance responsibilities.
- 1.5 The System shall treat a representation of a Payment Card-based Credential on an NFC Device as an Account separate from the Account associated with the Payment Card itself, and shall treat such Accounts independently. The System shall allow these two Accounts to be linked through a User's Profile. If so Configured by MBTA, the System shall incorporate both such Credentials in a single Account.
- 1.6 The System shall make use of the EMV-defined Payment Account Reference (PAR) once available to provide improved system efficiency and security benefits.
- 1.7 The System may aggregate multiple Taps on Readers together into single Authorizations and

Settlements (and shall do so, as and to the extent required by the Technical Requirements), but shall not so aggregate transactions generated from Fare Vending Machines, the System Website, or any other System Element unless such transactions are completed in a single User Session.

- 1.8 The System shall ensure that all transactions are properly classified by the Sales Channel which was used to conduct the transaction.
- 1.9 Settlements for all transactions shall be carried out by the System according to Payment Industry Standards and Payment Card Organization rules.
- 1.10 Settlements shall be submitted by the System at least daily.
- 1.11 The SI shall submit for Settlement payments from each Customer no later than twenty-four (24) hours and two (2) Business Days after the end of the Operating Day on which the Customer purchased Value or a Product or took a Trip, or earlier if required by Payment Industry Standards. Under no circumstances will the SI attempt to submit for Settlement additional payment from a Customer more than twenty-four (24) hours and two (2) Business Days after the end of the Operating Day on which the Customer purchased Value or a Product or took a Trip.
 - 1.11.1 In the event of a discovery of a miscalculation, or if additional Data about the Trip is received and processed by the System, and if either indicates that a User was charged more than the amount called for under Fare Policy, the SI shall Refund the User within one (1) Business Day from such discovery or receipt. The SI shall provide to each User the financial benefit of any adjustment and documentation that the User has been charged no more than the net/adjusted charge as part of the required Submittals in Appendix 4.2.
- 1.12 The System shall be able to be used by Users outside of the U.S. International phone numbers and addresses shall be supported for Registered Account contact details and international billing addresses shall be supported.
- 1.13 The System shall submit for Settlement payments from all Users with automatic renewal no earlier than five (5) days before the first day the Pass Product can be used.

2. Tap Payments Processing

The System's payments process must manage Authorizations and Settlements for each Contactless EMV Credential presented at a Reader, in coordination with the System's required risk management functions further described in Appendix 3.4 and 3.5.

- 2.1 If the risk management process requests Credential Authorization or Account Verification, the System shall generate a request for online processing also in accordance with the Payment Card Organization and Acquirer requirements as described in Appendix 4.7.
- 2.2 The System shall perform additional Authorizations during the day in order to meet Payment Industry Standards.
- 2.3 The System shall be capable of generating, and shall, if so Configured, generate Authorization requests for amounts different than those used by the Readers during interactions with presented Contactless EMV Credentials. The value of these amounts shall be Configurable to handle different Payment Card Organization transaction models.
- 2.4 Notwithstanding anything to the contrary in Appendix 3.5 or Appendix 3.7, and subject to Fare Policy and Configuration, if an Authorization is declined, the System shall deny further Taps using

that Credential until the Fare associated with the declined Authorization has been paid.

- 2.5 The System shall capture and be capable of reporting on issuer decline reason codes for analysis regarding potential improvements to payments processing. [CDRL: Report on issuer decline codes]
- 2.6 The SI shall regularly analyze declined Authorizations to determine whether any patterns arise to indicate an issue outside the System that could be resolved with the use of such data. The SI shall work with the Acquirer and Payment Card Organizations as applicable to determine potential ways to reduce declined Authorizations where appropriate. The SI shall follow through with those parties to bring about changes (including, for example, educating an issuer about the MBTA's introduction of open payments) and shall, as and to the extent called for by Configuration, implement changes within the System to restrict acceptance of Payment Cards which exceed Configured risk tolerance, including as provided in Appendix 3.5. Without limiting the SI's obligations in respect of the foregoing, the MBTA shall be entitled to undertake its own communication with the Acquirer, Payment Card Organizations, and issuers in respect of the Project to prevent and reduce declined Authorizations, and the SI shall cooperate with the MBTA in such efforts.
- 2.7 The System shall monitor Credential use following a transaction and, if necessary, carry out further Authorizations to cover the total amount due, subject to Configuration and limits on amounts and timing for such additional collections set forth in Appendices 3.5, 3.6, 3.7 and 4.2.
- 2.8 The System shall be Configurable to accommodate transit aggregation transaction models (as understood by reference to Payment Card Organization rules) and any new models introduced by and changes made thereto by any Payment Card Organization, and by choosing Authorization amounts consistent with Fare Policy and normal system usage, all to minimize the number of Authorizations required against any User's Credential in order to avoid any adverse action against the User by the Payment Card Organizations, and to minimize overall transaction processing cost.
 - 2.8.1 The Proposal shall explain how this will be done [PSR: Approach to minimize Authorizations].
- 2.9 The System shall ensure that for Trips that span either the MBTA and a Regional Transit Provider or more than one Regional Transit Provider, each User's Authorization fund decrease shall occur only once per Trip (except as defined in Section 2.2 above) for the entire Trip, not individually for each of the MBTA and Regional Transit Providers.
- 2.10 As open payment risks evolve, the SI must modify the System processes to manage payment risk. Risk experience must be comparable or better than prevailing retailer payment risk as understood by reference to Good Industry Practice.

3. Debt Recovery

The System shall perform debt recovery on Accounts with negative Account Balances or in response to a declined Authorization.

- 3.1 The System shall automatically send re-Authorizations (depending on and according to Payment Card Organization rules) at a Configurable frequency, over a Configurable period of time, and taking full advantage of applicable Payment Card Organization rules including using partial Authorizations.
- 3.2 The System shall immediately attempt Authorization for a Credential previously declined that subsequently attempts to Tap again at a Reader or is used in any Sales Channel (but is denied entry on this specific attempt).

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- 3.3 The System shall allow a User to submit payments via the System Website and Customer Support Software to clear uncollected debts for an Account.
 - 3.4 The System shall not accept, nor shall the System send debt recovery requests for, lost or stolen cards on the Acquirer's hotlist/restricted card list.
 - 3.5 If the System receives multiple, distinct Authorization declines followed by a successful Authorization, the System shall attempt to recover all debt due for collection up to any limits defined by Configuration.
 - 3.6 If some partial amount of the User's debt is recovered, the transaction model (as understood by reference to Payment Card Organization rules) shall be rerun by the System to determine if other amounts can be recovered by invoking other rules in the transaction model.
 - 3.7 Once all the debt is recovered, the Credential shall be accepted by the System in accordance with Configuration (including in respect of risk management) and the Account Data Timeliness Standards.

4. Fare Vending Machine Payments

- 4.1 All Fare Vending Machine transactions made with Payment Cards shall follow Good Industry Practice and Payment Card Organization rules for the acceptance at unattended user-operated points of sale, complying with relevant PCI-SSC standards, as described in Appendix 3.1.
- 4.2 All Fare Vending Machine transactions made with Payment Cards shall employ Good Industry Practice to drive Authorizations to the lowest cost interchange path (including PIN prompting for debit cards).
- 4.3 Any and all Payment Cards, including non-contactless Payment Cards, shall be accepted at Fare Vending Machines for the purpose of acquiring a Fare Card (and paying any associated Enablement Fee) or purchasing Products, subject to Configured risk management (including Velocity limits).
- 4.4 All payment transactions carried out at Fare Vending Machines shall prioritize the use of an EMV chip over the use of a magnetic stripe.
- 4.5 Magnetic stripe transactions shall only be performed in the absence of an EMV chip or if the EMV chip requires a magnetic stripe transaction in the case of fallback.
 - 4.5.1 In the Proposal, the SI shall explain whether and when magnetic stripe acceptance will be needed. [PSR: Magnetic stripe acceptance]
- 4.6 The ability of the Fare Vending Machine Payment Card reader to support fallback shall be Configurable. If configured not to support fallback, a Fare Vending Machine shall reject all non-EMV cards.
- 4.7 All Payment Card transactions at a Fare Vending Machine shall be completed online by the System with an Authorization.
- 4.8 If an Authorization is declined, the Fare Vending Machine shall inform the User with suitable messaging written in plain language. This message shall be included in the Submittal required by Appendix 2.3 for Customer-Facing Device screens. [CDRL: Card decline message]

- 4.9 If there is no connectivity between the Fare Vending Machine and the Communications Network, the System shall not permit Payment Card transactions and the Fare Vending Machine shall inform the User with suitable messaging written in plain language. This message shall be included in the Submittal required by Appendix 2.3 for Customer-Facing Device screens. [CDRL: FVM offline message]

5. Web Payments

All transactions with Payment Cards taken via the web, including those made via the System Website, Fare Card Mobile Application and Administrator Interface shall:

- 5.1 Follow Good Industry Practice for the acceptance of Payment Cards on the Internet, and be compliant with relevant Payment Industry Standards;
- 5.2 Utilize industry best practice card-not-present security features including Card Verification Value (CVV) and the Address Verification System (AVS);
- 5.3 Employ Good Industry Practice to drive Credential Authorizations to the lowest cost interchange path (including using CVV and AVS);
- 5.4 Be able to accept payments from international cardholders and therefore be able to recognize and handle international addressing standards;
- 5.5 Be able to accept payments from any and all Payment Cards and ACH WEB (eCheck) transactions, subject to Configured risk management (including Velocity limits);
- 5.6 Provide an eCheck data validation service that provides the User with a confirmation of the bank routing number entered (i.e. by displaying the name of the bank where the account is held); and
- 5.7 Be able to implement AVS validations inclusive of US and International AVS response codes. The use of AVS validations on the System Website and Fare Card Mobile Application shall not restrict the ability to accept payments from international cardholders (outside of the US).
- 5.7.1 The Proposal shall explain how this is accomplished. [PSR: Web international payment acceptance]

6. Customer Support Software Payments

- 6.1 All transactions with Payment Cards taken via the Customer Support Software shall follow industry best practice for the acceptance of Payment Cards over the phone, complying with relevant PCI-SSC standards, as described in Appendix 3.1.
- 6.2 All transactions with Payment Cards taken via the Customer Support Software shall employ Good Industry Practice to drive Credential Authorizations to the lowest cost interchange path (including using CVV).
- 6.3 The System shall be able to accept payments via a touchtone and voice recognition IVR, (and an equivalent for TTY/TDD) for automated payment processing without speaking to an agent.
- 6.3.1 The SI shall explain in the Proposal how this will be accomplished so as to preserve and ensure the information security and integrity compliance of the entire System regardless of the role of the MBTA and other call center agents. The Proposal shall explain how the SI will prevent the exposure of cardholder information to call center agents [PSR: Description of payments via touchtone and IVR]

- 6.4 For both IVR and agent payments, the System must allow acceptance of Payment Cards and ACH TEL transactions.
- 6.5 For all ACH TEL entries via IVR, the System must obtain the consumer's explicit oral authorization, via the telephone, prior to initiating a debit entry to the consumer's account, in accordance with the latest NACHA Operating Rules.
- 6.6 If IVR calls are recorded by the SI or the System, sensitive authentication data (as understood by reference to Payment Industry Standards and NACHA Operating Rules) shall be protected and shall be removed from recordings after Authorization.

7. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.6. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 4.1, 4.2 and 4.7. [PSR: Proposer team experience: Revenue collection and remittance]

APPENDIX 3.7

FARE POLICY AND FARE CALCULATION

The System shall correctly compute all Fares, monetary amounts, and Enablement Fees to be charged to Users for Transportation Services and Products in accordance with MBTA Fare Policy, perform the charges, and keep good records of the computations.

The Proposal shall address the Technical Requirements set forth in this Appendix 3.7 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Fare Policy and Fare Calculation general approach]

As part of the Technical Proposal evaluation, the SI shall perform a demonstration of the most similar such processes to those described in this Appendix 3.7 used in an existing deployment delivered by the SI . [Technical Proposal Evaluation: Demonstration]

1. Inputs

1.1 System Interactions

The System shall collect and process all Taps from Readers, Inspection Devices, the Tap API and any other Devices used by Users to access Transportation Services on any Modes of the MBTA or any Regional Transit Providers. As described in Appendix 3.5, the System shall manage the risk of non-collection of Fares as to each accepted Media.

1.2 Fare Policy

1.2.1 The System shall implement and effectuate the Fare Policy as promulgated by the MBTA. The Fare Policy may include Products or Configured Fares for which Users pay either before or after using Transportation Services. The System shall be capable of allowing Configured Fares and Products to be configured by:

1.2.1.1 Reduced Fare Group, Mode, route, Zone, Station/Stop, direction of travel, Transfer, time of day, day of week;

1.2.1.2 Daily, seven-day (rolling week) and monthly maximums by the same parameters as defined in Section 1.2.1.1; and

1.2.1.3 Any other similar categories or combinations of such categories as may be identified from time to time by the MBTA and any Regional Transit Provider.

1.2.2 The SI's proposal shall include a description of the capabilities and limitations of the proposed System's ability to implement Fare Policy. [PSR: Capabilities and limitations of System related to Fare Policy implementation]

1.3 Products

The System shall enable the sale and use of any and all Products established by the MBTA or by any Regional Transit Provider through Fare Policy. All Products shall be capable of being used with any Media recognized by the System, except as restricted by Payment Industry Standards. Without limitation, the System shall enable the sale and use of the following types of Products.

1.3.1 The System shall enable the sale and use of Best Value Products. The System must be capable of enabling Best Value Products offered jointly by the MBTA and a Regional Transit Provider.

- 1.3.2 The System shall enable the sale and use of Trip-Based Products and Pass Products. Without limitation, the System shall also enable the sale and use of the following types of Trip-Based Products and Pass Products:
- 1.3.2.1 Daily, weekly and monthly Trip-Based and Pass Products that permit a User, using any accepted Media, to access Transportation Services across designated Modes, Zones, times of day, and days of the week.
 - 1.3.2.2 Pass Products that permit a User to circumvent Anti-Passback Controls on Gates for purposes specified by the MBTA (“Multi-Tap Products”).
 - 1.3.2.3 Stored Value Products. The System shall enable the sale and use of Stored Value Products.
 - 1.3.2.3.1 The value of Stored Value Products available, including minimum amounts, maximum amounts and amount intervals, shall be Configurable by the MBTA for each Sales Channel and Reduced Fare Group.
- 1.3.3 The System shall be capable of automatically charging Extension Fares.
- 1.3.4 The System shall be capable of calculating Fares based on a User’s Transfer. Without limitation, the System shall be capable of applying Transfer Fares based on a specified maximum amount of time the User may take to accomplish a Transfer between Segments of a Trip, and based on maximum Trip durations, by Mode, route, and day of week. The System shall also be capable of applying Transfer rules for specific Stations and Stops to enable free or specially priced Transfers between particular Transportation Services.
- 1.3.5 The System shall be capable of calculating an additional charge to a User over and above a Configured Fare based on misuse of a Credential. A Penalty Fare will apply in situations defined in MBTA Fare Policy, potentially including failure to Tap when required, or riding beyond the limitations of a Pass Product without an Extension Fare.
- 1.3.6 The System shall be capable of basing a Fare on the route most likely taken by a User where multiple route possibilities exist. Such a determination may be made from such Fare Data as total travel time between Readers and a User’s typical travel routes. The System shall be Configurable as to whether to apply the lowest possible Configured Fare in such cases.
- 1.3.7 The System shall be capable of implementing Joint Fares. A maximum of 3 carriers or agencies (RTPs or the MBTA) may be covered by a single Joint Fare.
- 1.3.8 The System shall be sufficiently adaptable, Configurable and customizable to accommodate future changes to the MBTA Fare Policy and implement the MBTA’s future operations. In maintaining the System, the SI shall use best efforts to incorporate Updates and Upgrades to maintain such configurability and customizability, and to anticipate likely additional functionalities based on custom and practice in the transit industry, both at the Date of Award and as said custom and practice may develop over the Term.
- 1.3.8.1 The Proposal shall describe the SI’s approach to identifying and adapting to fare policy trends, including the use of the SI’s industry expertise and its ability to draw on best practices from other transit systems. [PSR: Method of identifying and adapting to fare policy trends]
- 1.3.9 The System shall have the capability to deny Taps based on blocking or suspension of an Account, whether pursuant to Fare Policy or otherwise Configured, regardless of Account balance.
- 1.3.10 The System shall implement any distinctions or differences that the Fare Policy shall establish as to Standard Fare Cards and Temporary Fare Cards, including differences in Enablement Fees.
- 1.3.11 The System shall permit Stations or Stops on the boundary of two Zones to be defined as existing within either such Zone, depending on the User’s route of travel.

1.3.12 Reduced Fare Groups

The System shall implement accurate Fare computation for Reduced Fare Groups, both as defined in the MBTA's current Fare Policy and as they may be defined in the future.

1.3.12.1 Definition of Groups. The System shall permit the Configurable creation of new Reduced Fare Groups and be capable of implementing revised Fare Policies. The MBTA Fare Policy identifies the current recognized Reduced Fare Groups.

1.3.12.2 Free travel. The System shall accept Taps from Users of particular Groups and from MBTA Personnel Accounts without charging a Fare as set forth in the Fare Policy and Configuration, and to use any Media otherwise accepted by the System for such Taps.

1.3.12.2.1 The System shall permit children 11 and under to access the Transportation Network without use of Media when accompanied by a User with Media, to the extent age can be reasonably determined.

1.3.12.2.2 The System shall permit attendants or guides for members of a Reduced Fare Group to access the Transportation Network for free, if so specified in MBTA Fare Policy.

1.3.12.2.3 The System shall Configurably permit Users of AFC 1.0 Media meeting certain criteria (to be developed by the SI and approved by the MBTA) to access Transportation Services, subject to other Technical Requirements about the reading of AFC 1.0 Media in Appendix 3.2, 3.3, and 3.4. [CDRL: AFC 1.0 Media acceptance criteria]

1.3.12.3 Expiration. The System shall be capable of applying an expiration date to a User's membership in a Reduced Fare Group, and to apply Reduced Fare Group memberships that do not have an expiration date, such as Configured Fares for senior citizens. The Proposal shall describe the method for ongoing configurable validation of eligibility for Reduced Fare Group. [PSR: Method for ongoing configurable validation of eligibility for Reduced Fare Group]

1.3.12.4 All payment forms. The System shall permit a member of a Reduced Fare Group to use any Media recognized by the System. The System may not restrict members of a Reduced Fare Group to only using a Fare Card.

1.3.12.5 Eligibility. The System shall be capable of permitting non-MBTA organizations, including schools that may issue Fare Cards, to determine a User's eligibility for Reduced Fares, and must enable such non-MBTA organizations to create Accounts for members of Reduced Fare Groups, all as further defined in Appendix 3.8. The System must enable MBTA approval and monitoring of the Accounts of members of Reduced Fare Groups that are managed by non-MBTA organizations. The System must permit the MBTA and/or the SI to restrict what types of Accounts particular non-MBTA organizations may manage and/or create.

1.3.12.6 Employees, contractors and first responders. The System shall enable Users of MBTA Personnel Accounts, first responders, and other Users designated by the MBTA to receive free Transportation Services and access to the Paid Areas of Stops and Stations.

1.3.12.6.1 Media issued to such Users shall be capable of allowing circumvention of Anti-Passback Controls, as specified per User or Group by the MBTA.

1.3.12.6.2 Media issued to such Users shall be capable of being subject to expiration dates.

1.3.13 The MBTA will not define or restrict commissions and fees that the SI pays to Retail Reload Locations as part of Fare Policy.

1.3.14 The System shall support the sale of Zoned and distance-based Products without requiring the User to know what Zone he/she is traveling from/to.

1.4 Configured Fare Table

The SI shall maintain a table identifying the all applicable Configured Fares for all possible Trips a User of Transportation Services may take. The Fare table shall include Configured Fares to and from all service points (Stations and Stops) for all Fare Policy rules and Groups. The Configured Fare table must also include Extension Fares, maximum Trip lengths, maximum Transfer times, Transfer restrictions and other parameters needed to specify and calculate specific Fares based on the Configured Fares. The System shall use the Configured Fare table to compute Fares, unless the SI specifies a different method of determining Fares in its Proposal and such method is incorporated in Appendix 6. The SI shall update the Configured Fare table (or accepted alternative) throughout the Term. [PSR: Alternative to Fare table] [CDRL: Fare table]

1.5 Revenue Apportionment Table

The SI shall maintain a table specifying all Revenue Apportionments between or among the MBTA and all Regional Transit Providers (RTPs) for all possible Trips. The Revenue Apportionment table shall specify all splits between or among RTPs and the MBTA by distance, sum of non-Joint Fares, minimum and maximum percentages and absolute amounts of Configured Fares apportioned to each RTP and the MBTA. The SI shall detail methods for handling all Product requirements in Section 1.3. The Revenue Apportionment table will be subject to approval by the MBTA. The SI shall modify and amend the Revenue Apportionment table when Fare Policies, apportionment rules, agencies and RTPs change. The MBTA will define and provide the SI with relevant Revenue Apportionment rules, in conjunction with the other RTPs and carriers involved. The SI shall use the Revenue Apportionment table to calculate revenue except to the extent it proposes an alternative Revenue Apportionment process explaining an alternative method of calculating the above. [PSR: Alternative to Revenue Apportionment table] [CDRL: Revenue Apportionment table]

2. Fare Calculation Process and Risk Management

2.1 Fare Calculation Process

Using the capabilities set forth in this Appendix 3.7, the System shall correctly calculate Fares for all Trips, including calculation of all Fare elements such as Transfer Fares, Extension Fares, and matching all Trips to any applicable Group and/or any applicable Pass. Without limitation, the System shall implement the following processes in the calculation of a Fare. [CDRL: Fare calculation process details]

2.1.1 The System shall process all Taps in an Operating Day for all Media.

2.1.1.1 Tap processing shall be completed by the System in such timeframes as necessary to:

2.1.1.1.1 comply with all timing requirements of Appendix 4.2 and,

2.1.1.1.2 comply with the Account Data Timeliness Standards.

2.1.1.2 The System shall associate each Tap with the Gate, Validator, Inspection Device, or Integrated Service on which it occurred, together with the date and time of the Tap.

2.1.1.3 The System shall be capable of requiring a User to Tap in before using Transportation Services, and to Tap out after reaching his or her destination, on all Modes.

2.1.2 The System shall collect Fare Data for all Trips taken by all Users, including the route/Mode, time of day, Transfers, Media used, Product used, and any other information as required by the MBTA, subject to the standards set forth in Appendix 3.1A.

- 2.1.3 The System shall process all Taps and attempted Taps (where Media is presented to the Reader, but the Credential is not accepted, Authorized or Mutually Authenticated – see Appendices 3.2, 3.3 and 3.4). In addition to the other Fare Data required to be collected by these Appendices, the System shall apply and store status and a reason information for each valid and invalid Tap.
- 2.1.4 Where the System does not record a User’s Tap out, the System shall be capable of applying an assumed Tap that is determined through extrapolation from the User’s typical travel patterns, if and as allowed by Fare Policy.
- 2.1.5 Automatic Refunds. In the event of a discovery of a miscalculation, or if additional Data about the Trip is received and processed by the System, and if either indicates that a User was charged more than the amount called for under Fare Policy, the SI shall Refund the User. The SI shall provide to each User the financial benefit of any adjustment and documentation that the User has been charged no more than the net/adjusted charge as part of the required Submittals in Appendix 4.2. The SI shall continually monitor and adjust the System to limit the need for such adjustments to Fares and Refunds due to miscalculations.
- 2.1.6 MBTA Service Failures. Without limitation, the System shall be capable of executing Fare adjustments and Refunds to Users in response to MBTA Service Failures of either the System or in the Transportation Network. The SI shall review operational status information via MBTA published interfaces (as defined in Appendix 3.10) to be provided by the MBTA for the purpose of determining whether Fare adjustments or Refunds must be applied to Users due to an MBTA Service Failure that impacted the User.
- 2.1.6.1 The System shall be capable of Refunding all or part of a Fare if a Segment of the User’s Trip is interrupted due to a MBTA Service Failure, if and as allowed by Fare Policy.
- 2.1.6.2 If the MBTA Service Failure prevents a User from reaching his or her destination via his or her chosen route, the System shall automatically apply the Configured Fare for the User’s chosen route even if the User uses an alternate route to reach the destination, if and as allowed by Fare Policy.
- 2.1.6.3 The System shall adjust or Refund any Extension Fare or Penalty Fare for the User’s Trip where such a Fare is charged as a result of an MBTA Service Failure, if and as allowed by Fare Policy, and as a result of an MBTA System Failure (including Gate or Validator malfunctions, for example).
- 2.1.6.4 The System shall have a method to apply a Refund automatically if the User Taps on a temporary replacement service, such as bus replacing Rapid Transit, or Rapid Transit replacing Commuter Rail, if and as allowed by Fare Policy. The SI shall investigate MBTA operating practices to develop this method.
- 2.1.6.5 The Proposal shall include information on the Proposer’s experience using similar information to automatically adjust fare calculations and Proposer’s understanding of the challenges. [PSR: Experience and understanding of automation of use of MBTA Service Failure Data]
- 2.1.7 The System must shall maintain a log showing each calculation used to arrive at the value of a Fare, including its basis in Configured Fares, but adequately isolated from PII so as to comply with the requirements of Appendix 3.1A. [CDRL: Fare calculation log]
- 2.1.7.1 The Proposal shall include a sample Fare calculation log. [PSR: Sample Fare calculation log]
- 2.1.8 The System shall accurately calculate Fares for Transportation Services provided by any Regional Transit Providers.
- 2.1.9 When the MBTA implements a change to Fare Policy, the System shall calculate Fares for each Trip based on the Fare Policy in effect at the time the Trip began, and be able to do so retroactively to properly implement the requirements of Appendix 4.2. The SI’s Proposal

shall include a description of its process for handling multiple Fare Policies. [PSR: Multiple Fare Policy handling processes]

- 2.1.10 The System shall use Vehicle and Reader location Data (as defined in Appendix 4.5) to determine the Zone and route in which any Vehicle is operating for purposes of Fare calculation.
- 2.1.11 The System shall use Vehicle and Reader location Data (as defined in Appendix 4.5) and do so to automatically ignore any Taps made on Readers on Vehicles while those Vehicles are underground at and between Gated Stations.
- 2.1.12 The System shall be capable of supporting discounts and promotions. The amount of the discount shall be Configurable for a dollar value or percentage up to the amount of the full value of any Product.
 - 2.1.12.1 The System shall be capable of supporting promotional or third party sponsored Configured Fares through the use of discount codes entered by Users (as described in Appendix 3.8). The System shall be capable of generating unique, single use discount codes and multiple use discount codes. The System shall support custom/vanity discount codes to align with campaign branding. The total number of uses, number of reuses on a single Account and dates of validity shall be Configurable for each discount code or group of discount codes. The System shall only accept discount codes which are authorized and active. The use of discount codes shall be reported in the System's reporting and database services, as further defined in Appendix 4.5.
 - 2.1.12.2 The System shall be capable of supporting promotional or third party sponsored Configured Fares for a subset of Users/Trips or all Users/Trips based on specified Account attributes, single or recurring time periods, Media types, Credential attributes, routes, lines or Modes.

2.2 Managing Risk and Timing

The System shall compute Fares with sufficient regularity and frequency to manage effectively the risk of nonpayment as described in Appendix 3.5, to comply with the requirements of Appendix 3.6 and Appendix 4.2, and to comply with the Account Data Timeliness Standards. The System shall never deny a Tap for an Account having at least the minimum possible Configured Fare for the Transportation Services the Account's User seeks to access via that Tap. The SI shall document these computation procedures for MBTA reference. [CDRL: Detailed method of managing Fare risk]

- 2.2.1 The System shall apply to Accounts all transactions made at Fare Vending Machines, the System Website, the Customer Support Software, Retail Reload Locations, Administrative Point of Sales, and the APIs.
- 2.2.2 The minimum Products required for an Account to have for the System to accept a Tap to access to Transportation Services shall be Configurable; such Configuration shall include the ability to allow negative balances. This Configuration shall be possible by various parameters including Group, Mode, route, Zone, Station/Stop, direction of travel, Transfer, time of day, day of week, and Enablement Fee paid.
- 2.2.3 Any Fare for a Trip shall be computed and applied to the applicable User Account within twenty-four (24) hours of the end of the Operating Day on which the Trip ended. This timeframe does not relieve the SI of the other obligations referenced in Section 2.2 above.
- 2.2.4 Under no circumstances will the System deduct or consume any Product from an Account seventy-two (72) hours or more after the Trip ended.
- 2.2.5 The System may include additional measures to mitigate risk of nonpayment, provided, however, that a Tap shall not be denied because a Best Value Fare maximum or other appropriate limit has not yet been computed and applied. Such measures may include

differing speeds of Fare calculation depending on characteristics of the Account or Tap.
[CDRL: Varying measures to mitigate nonpayment]

- 2.2.6 Minimizing processing times will provide a superior experience for Users, and the System shall be designed and operated with this expectation in mind.
 - 2.2.6.1 The Proposal shall include information about the Proposer's past approaches to optimizing account and fare processing times and how those will be applicable to the Project. [PSR: Account and fare processing optimization]

3. Outputs

3.1 Computed Charges

The System, no later than the end of each Operating Day, or as needed during each Operating Day (where such need is defined by the Contract Standards and includes Section 2.1.1.1), shall:

- 3.1.1 Record and price all Trips taken as described above, all Trips for which no additional Fare is charged, such as Trips taken using a Pass Product, and exceptions such as Extension Fares. Each Trip must be tagged with a Fare Policy status – whether it was a part of a Pass usage, Stored Value, Reduced Fare, free Trips, Best Value, etc. These status tags must be included in all Documentation and reporting. The System must comply with requirements of Appendix 3.1A in meeting this requirement. [CDRL: Pricing for all Trips daily]
- 3.1.2 Conduct the appropriate action to constitute the Trip payment. This includes 1) debiting the Stored Value from an Account; 2) consuming the Pass Product as defined in Fare Policy; or 3) charging the User as described in Appendix 3.6.
 - 3.1.2.1 When charging the User using a Contactless EMV Credential as described in Appendix 3.6, the System shall aggregate the charge due by a User until a dollar or time limit is reached as further explained in Appendix 3.6.
- 3.1.3 The System shall properly compute charges (or delay computing charges) in instances where the full Fare Data is not transmitted to the System, for example, by failure of a Reader or Validator. Doing so shall not relieve the SI of the computation and deposit requirements of Appendix 4.2 nor the restrictions on timing of charges to Customers in Appendix 3.6 and Section 2.2.4.
- 3.1.4 The SI shall report to the MBTA any instance in which the System allows access to Transportation Services via a Tap, but the Tap cannot be linked to an Account or Trip. In such instances, the applicable Fare shall be included in Fare Revenue due to the MBTA as defined in Appendix 4.2. [CDRL: Report on unlinked Taps]

3.2 Revenue Apportionment

The System shall compute Revenue Apportionment for all Trips across Regional Transit Providers in accordance with the Revenue Apportionment table or accepted alternative. The amount due to a Regional Transit Provider for Trips entirely on its facilities shall also be computed and used for revenue settlement.

3.3 Data Log and Storage

The System shall maintain a Data log of all User Interaction, revenue and ridership Data. The System shall maintain the Data log in such a manner that the MBTA and its RTPs may audit all revenue on 24 hours' notice. The System shall permit the MBTA to define the duration of time in which the System stores the information in the Data log. Data shall be retained in accordance with the requirements of Appendix 3.1 and Appendix 3.1A. The log shall comply with the requirements of Appendix 3.1A. [CDRL: Data Log of User Interaction, revenue and Ridership Data]

3.4 Reporting

The System shall provide reporting and database services, as further defined in Appendix 4.5. The System must report all single ticket revenue, Pass Product revenue, apportionment details for Joint Fares, and Data on Taps, Trips, Enablement Fees, Pass Product usage and Fares calculated of Users in all Groups, by Group and issuing organization, to allow the MBTA to analyze and report in detail on the Trips taken and Products issued, with Data segmented to comply with the requirements of Appendix 3.1A.

4. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.7. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.5, 3.1, 3.8 and 3.10. [PSR: Proposer team experience: System capabilities and information security]

APPENDIX 3.8

ACCOUNT MANAGEMENT

User Accounts are the foundation of the System’s customer service function. The System must enable Users to access, modify and take action relating to their Accounts through the Sales Channels and must support Account Administrators in managing Accounts on behalf of Users.

The Proposal shall address the Technical Requirements set forth in this Appendix 3.8 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer’s proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer’s approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA’s needs. [PSR: Account Management general approach]

1. Accounts

Accounts must be maintained in accordance with all Technical Requirements, including but not limited to those for Data storage, information security, testing and integration, and performance.

- 1.1 The System shall enable Users to create Accounts registered to them by name or other identifying information (“Registered Account”).
- 1.2 The System shall permit Users to create Accounts that are not registered to the User by name or other identifying information (“Unregistered Account”).
- 1.3 The System shall enable Administrators to manage Registered and Unregistered Accounts. (“Administrator Accounts”).
- 1.4 The System shall permit any User to purchase Products associated with the User’s Account using any Transaction Channel, except:
 - 1.4.1 as defined in Appendix 2.15 with respect to payment types accepted at Retail Reload Locations, and
 - 1.4.2 as contravened by the requirement in Section 1.9 of this Appendix 3.8 with respect to limitations on the accepted payment methods for Contactless EMV Credential-linked Accounts.
- 1.5 Price Variations Based on Account
 - 1.5.1 The MBTA Fare Policy may Configure different Configured Fares to be available to Registered Accounts versus Unregistered Accounts, and the System shall accommodate any such Configured Fare differences.
 - 1.5.2 The System shall allow Configured Fares and Enablement Fees to vary by Group, Configurable by the MBTA.
- 1.6 Account Data
 - 1.6.1 The System shall associate any User Interaction with the correct Account.
 - 1.6.2 User Interactions using the same Credential shall be associated with the same Account.
 - 1.6.3 The System shall apply all Account management features (as set forth below) and Fare calculation steps (as described in Appendix 3.7) to the correct Account.
 - 1.6.4 The System shall maintain Account history with transaction level detail that distinguishes between order acceptance, order fulfillment, payment for orders, and charges for travel.

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- 1.6.5 The Account history across all Media and payment methods must be retained if either is changed.
 - 1.6.6 The System shall continually update all Account Data such that the System shall comply with the Account Data Timeliness Standards.
- 1.7 Privacy and Access to Data
- The System shall protect all PII in accordance with applicable Privacy Laws, Appendices 3.1, and 3.1A, and as follows.
- 1.7.1 Only authorized Registered Users, Alternates (defined in Section 3), and Administrators (subject to specific delegated authority defined in Section 3) shall be permitted to access Data associated with a Registered Account.
 - 1.7.2 Unauthorized third parties, including Group Administrators for Groups to which the Account belongs, shall have no access to a User's travel and service history. Access to a User's travel and service history shall be controlled through Administrator Account permissions as described in this Appendix 3.8.
 - 1.7.3 The SI and Administrator Accounts shall have limited and as-needed access to User Data (in accordance with Appendices 3.1 and 3.1A).
 - 1.7.3.1 Any access to User Data by SI and/or Administrator Accounts (authorized or unauthorized) shall be identified and maintained in an access log. [CDRL: Access log for User Data]
 - 1.7.4 Any requirement to enter the CVV on a Payment Card or Fare Card shall be only for security and identity verification purposes, and the CVV from a Payment Card must never be stored.
 - 1.7.5 The System shall provide functionality to ensure compliance with Data pertaining to Minors under COPPA and other federal and state laws and regulations (as required under Appendices 3.1 and 3.1A).
- 1.8 Write-Off Handling
- Once an Account (other than a postpaid or revolving Account) has a negative Account Balance for a period of thirty (30) consecutive days, the System shall:
- 1.8.1 Prevent any further use of that Account in the System (either permanently or reversible on a Configurable basis), reverse the Enablement for any Fare Card associated with the Account (in other words, require a User to pay another Enablement Fee to re-Enable those Fare Cards), ensure that any electronic payment methods (Payment Cards, ACH accounts etc.) previously used to purchase Products or pay for Trips for this Account are prevented from being used in the System, and reassign any Fare Cards associated with the Account to a new Unregistered Account and remove any Enablement associated with those Fare Cards.
 - 1.8.2 Produce an Account write-off report breaking down the negative Account Balance for that Account into:
 - 1.8.2.1 Amounts already deposited to the MBTA as defined in Appendix 4.2.
 - 1.8.2.2 Amounts not due for deposit to the MBTA, with an indication for each portion of those amounts of one of the specific exceptions identified in Appendix 4.2.
 - 1.8.2.3 Negative Account Balance amounts if and as allowed by Fare Policy as set out in Appendix 3.7.[CDRL: Account write-off report]
- 1.9 Across all Sales Channels, for Accounts using a Contactless EMV Credential as a primary Credential, the System shall only accept payments for that Account via a Payment Card if so required by Payment Industry Standards.

- 1.10 Wherever the System handles addresses or phone numbers, it must support international addressing standards and comply with the requirements of Appendix 3.6 with respect to handling international addresses in processing of Payment Cards.

2. Profiles

The System shall support access to Registered Accounts and Administrator Accounts through a Profile.

- 2.1 The System shall require a Profile for each Registered User and Account Administrator and not allow Profiles for Unregistered Users.
- 2.2 The System shall support the creation of Profiles for individual Users and Groups.
- 2.2.1 In addition to Group functions identified in this Appendix 3.8, Group Profiles shall have the same functionalities as Profiles in this Appendix 3.8.
- 2.3 The Profile shall allow a User:
- 2.3.1 To create and delete his/her Profile.
- 2.3.2 To create and view his/her username.
- 2.3.3 To create, change and reset his/her password.
- 2.4 User Logins
- 2.4.1 Logins shall comply with password requirements described in Appendix 3.1.
- 2.4.2 Logins shall provide an option (PIN or similar) for Registered User authentication by the Customer Support Software.
- 2.4.3 The System shall ensure that Accounts are linked to their corresponding Profiles through challenge questions to prevent fraud or misuse. All Registered Users and Account Administrators shall be required to create a minimum of one (1) secret question and answer, or similar security process, to protect the security and privacy of the Profile and its Account(s).
- 2.4.4 The System shall provide and enable the User's choice to opt-in to two-factor authentication.
- 2.4.5 The System must enable the User options to recover and/or reset a forgotten username or password.

3. Account Types

3.1 Customer Accounts

The System shall allow all Users to interact with and manage their Accounts on a self-service basis, and must permit the SI to manage each Account as specified herein. The System shall permit Users to create, view, and update Account Data in accordance with this Appendix 3.8, and Appendices 3.1 and 3.1A.

3.1.1 Creation

The System shall automatically create a corresponding Unregistered Account when each Credential is first known to the System, except that:

- 3.1.1.1 For Fare Cards prepared by the SI in response to an order or request associated with a Registered Account or Group, the System shall create/use a Registered Account; and
- 3.1.1.2 For Enhanced Fare Cards, the System shall create/use a Registered Account.

3.1.2 Unregistered Accounts

Unregistered Accounts are those without any associated User PII, contact details or Profile.

- 3.1.2.1 Access
The System shall allow a User to access his or her Unregistered Account information by providing only the Credential number and CVV (or equivalent) number associated with the Media.
 - 3.1.2.1.1 The System must prevent fraud and misuse of Unregistered Accounts through challenge questions. Challenge questions for Unregistered Users shall be associated only with the relevant Credential and not PII. For example, questions could be related to the Media, recent travel or recent Product purchases.
- 3.1.2.2 PII
The System shall not associate any User PII with an Unregistered Account's Credential. The System shall not enable Users with Unregistered Accounts ("Unregistered Users") to use any features that would require the System or SI to contact the User or store any User PII, including notifications.
- 3.1.2.3 Converting to a Registered Account
The System must permit a User to change a Registered Account into an Unregistered Account.
- 3.1.2.4 Only one Credential can be associated at one time with an Unregistered Account. Previously associated Credentials (for example, in the case of a replacement because of loss or damage) shall be stored with the Unregistered Account for historical reasons but shall no longer be accepted by the System for travel.
- 3.1.3 Registered Accounts
The System shall allow Users who have Registered Accounts ("Registered Users") to control such Accounts through Profiles and associate their names and other identifying information with the Account.
 - 3.1.3.1 Access
Registered Accounts shall be accessed through Profiles, as described in Section 2 of this Appendix 3.8.
 - 3.1.3.2 Data
Each type of Account shall have extensively Configurable data elements captured and stored. For example, Registered Accounts will include contact information and Registered Accounts associated with a Group will have organization identifying information and may have tax identifiers.
- 3.1.4 Alternates
The System shall enable a Registered User to authorize, using sufficient authentication and verification controls, an Alternate permitted to control, manage, and maintain the Account on behalf of the Registered User.
 - 3.1.4.1 The Alternate shall have his or her own Registered Account and Profile, which may be used to manage his or her own Account and act as the Alternate on multiple Accounts.
 - 3.1.4.2 The Alternate shall not have access to change the Registered User's PII.
 - 3.1.4.3 The Alternate shall not have access to view or change the password of the Registered User.
 - 3.1.4.4 The Alternate shall not have access to view the details of the Registered User's stored payment methods.
 - 3.1.4.5 The Alternate shall have access to make/change purchases, view travel and service history, view/change User Established Customizations, and view/change notification and contact preferences on behalf of the Registered User.

- 3.1.5 MBTA Personnel Accounts
The System shall support the creation of MBTA Personnel Accounts for MBTA Persons using Enhanced Fare Cards.
- 3.1.6 The SI's Customer Accounts proposal shall explain how:
 - 3.1.6.1 Unregistered Accounts will be created, accessed and authenticated, including the use of challenge questions and fraud prevention methods.
 - 3.1.6.2 Registered Accounts will be created, accessed and authenticated, including phone authentication of Registered Users, the use of challenge questions, and recovery of a forgotten username or password.
 - 3.1.6.3 Unregistered Accounts can be converted to Registered Accounts.
 - 3.1.6.4 Account support will be provided to Unregistered Users without associating the User's PII with the Credential, including Account enquiries, defective Fare Card replacements, and upgrades from a Temporary Fare Card to a Standard Fare Card as described in Section 5.
 - 3.1.6.5 MBTA Personnel Accounts will be created, accessed and authenticated.
 - 3.1.6.6 Access will be provided for the Alternate.
[PSR: Customer Accounts]
- 3.2 Administrator Accounts
The System shall enable Administrator Accounts to manage Customer Accounts on behalf of Customers.
 - 3.2.1 The System shall allow an unlimited number of Administrator roles, each with its own set of Configurable responsibilities and permissions.
 - 3.2.2 The Administrator role permissions shall be Configurable to include all Account management features available to Registered Users and Account Administrators as described in Section 5. Each numbered item in Section 5 shall be separately enabled or disabled for each Administrator role.
 - 3.2.3 For example, and in the avoidance of doubt, the SI shall configure and test the following Administrator roles in addition to any others Configured by MBTA:
 - 3.2.3.1 MBTA Administrators.
 - 3.2.3.2 Call center agents. Customer Support Software requirements are described in Section 6 of this Appendix 3.8.
 - 3.2.3.3 Third party Group program servicing. The System shall enable a third party retained and authorized by the MBTA to service Group Accounts. Management of Group Accounts may include fulfillment for: purchasers of corporate and semester passes; users of The RIDE; and online orders. Management of Group Accounts may also include customer service for corporate, semester and RIDE customers, including lost cards, Refunds and Account Balance checks. The System shall be capable of securely transferring needed Fare Cards and account information to a third party if so designated by the MBTA.
 - 3.2.3.4 Reduced Fare Group Eligibility Administrators. The System shall enable MBTA and non-MBTA authorized staff to manage Registered Users' Reduced Fare Group Eligibility, as described in Appendix 3.7 ("Reduced Fare Group Administrators"). Each Reduced Fare Group shall have its own administrator(s). Administrators' access shall be limited to their assigned Group(s).
 - 3.2.3.5 Group Administrators.
 - 3.2.3.6 Administrative Point of Sale Administrators.
 - 3.2.4 The System shall support automatic self-service provisioning of Group Account Administrators, MBTA-facilitated creation of Group Account Administrators, and similar

facilitation by the third party Group program Administrator. Requirements for Groups are described in Section 4 of this Appendix 3.8.

4. Groups

The System shall enable the creation of Groups of Accounts based on Accounts with an attribute in common or a list of Account identifiers. Groups shall support use for a variety of purposes, including schools, employers, and Integrated Services API Funds Pools.

- 4.1 The System shall have the capacity to enable this functionality to be accessed, used, and processed by Groups encompassing a large volume of assigned/associated Accounts, with a limit of no fewer than 100,000 associated Accounts for each Group, and no limit on the number of Groups.
- 4.2 Each Group shall have its own Configurable administrator(s). Administrators' access shall be limited to their assigned Group(s). Administrators shall be able to be Configured to manage multiple Groups.
- 4.3 The System shall manage Groups to ensure proper accounting of Use Cases such as pooled funds across associated Accounts, rolling funds from month to month, and Fares incurred beyond those covered by a Pass program. The System shall provide functionality to facilitate a variety of Use Cases for Group Accounts, including:
 - 4.3.1 Automatic periodic transfer of Product (including a Stored Value amount) from a Group Account to a Registered Account which is not a member of a Group, and including automatic periodic transfer of up to a certain Stored Value amount, limited by the extent to which that amount was used in a prior month.
 - 4.3.2 Post-paid invoicing for Group Accounts deemed creditworthy by the MBTA, including capability of flowing that designation down to Registered Accounts associated with that Group Account (so that, for example, employee travel for the month would be invoiced to the Group and those employee accounts would remain in negative Account Balance status – but permitted to continue to receive accepted Taps – until that payment was made).
 - 4.3.3 Configurably conditioning certain entitlement for Group Account benefits to Users opting in to share Level 1 (mobility) Data with the Group Administrator.
 - 4.3.4 Configurably compartmentalizing Products transferred from Group Accounts to Registered Accounts which are not a member of a Group such that the Group Administrator can reclaim unused Products.
 - 4.3.5 Ability for a Registered Account associated with a Group Account to be added to both by the Group Administrator and the Registered Account User, for example, for the User to add a Stored Value Product to supplement a Pass Product subsidized by an employer to cover Fares for Trips which extend beyond the entitlement conveyed by the Pass Product.
- 4.4 The SI shall invoice and collect amounts due from all Groups in a manner consistent with Good Industry Practice, and implement a wide variety of revolving, post-paid, and pre-paid Group schemes consistent with MBTA Fare Policy and Configuration, and specific handling for API Funds Pools as defined in Appendix 3.9. The SI shall work with the MBTA to develop invoicing, collection, notice, and travel blocking standards for these different Group schemes and tiers of Group creditworthiness and track record as customers or partners of the MBTA. The System shall implement these procedures and requirements.
- 4.5 A Group Administrator shall be able to Configurably require its members to initiate all Account management requests supported for Registered Users and changes through the System, including lost/stolen cards, replacement card requests, changing the Fare Card number associated with the

Account, and changes to automatic renewals. The System Website shall provide facility for Users to do so.

- 4.6 System shall support Groups using Custom Fare Cards (as described in Appendix 4.4), using standards defined by the SI and as further described in Appendix 4.4. All Custom Fare Cards accepted by the System shall comply with all requirements for Fare Cards described in Appendix 2.6.
- 4.7 The System need not allow the use of Contactless EMV Credentials at Readers for Accounts in a Group if that Group funds its Accounts using a Transaction Channel not involving a Payment Card, except that the Fare Card Mobile Application specified in Appendix 2.6 shall be available for use for travel by Accounts in a Group.
- 4.8 The System shall provide confirmation and notification to Users and, Configurably, MBTA and the MBTA's third party Group program administrator of Group file uploads and changes, and of errors encountered by the Group when attempting to manage User Accounts.
- 4.9 Regulatory Compliance. "Transit Benefits" are Federal Government-supported, employer-sponsored tax benefit programs through which employers can provide employees with funds, up to the IRS federally-defined limits, as tax-free and pre-tax benefits to be used for public transportation privileges, public transportation parking privileges and other Federally identified transportation benefit programs. The System shall provide functionality to facilitate User compliance with Applicable Law including IRS Revenue Ruling 2006-57 and other Internal Revenue Service ("IRS") regulations in administering tax-advantaged payment for transit fares and parking.
 - 4.9.1 The System shall comply with all applicable IRS regulations for pretax commuter benefits, including identifying payments made and Products purchased using a pretax funding source and using merchant category codes to identify charges as transit.
 - 4.9.2 The System shall at all times over the Term be monitored and Updated/Upgraded by the SI so to remain current with any changes in and amendments to IRS-related laws, regulations and guides as they relate to tax-advantaged programs impacting transit fares.
 - 4.9.3 The System shall properly categorize API transactions, and properly segregate funds if so Configured to restrict use of tax-advantaged funds to be used in API transactions for service categories other than those allowed by the Applicable Law.
- 4.10 The SI shall migrate of Groups from AFC 1.0 to the System as specified in Appendix 4.4.
- 4.11 The System shall enable the administration of Pass Products and Configured Fares applicable to Reduced Fare Groups overall, Reduced Fare Groups associated with a Group, and Groups specifically.

5. Account Management Features

- 5.1 Account Management Functionality for Registered and Unregistered Accounts
Unregistered and Registered Accounts shall support the following Account management functionality:
 - 5.1.1 Balance and Product information. The System shall display Pass Products and/or Stored Value Account Balance to the User.
 - 5.1.2 Purchase and transfer Products. Users shall be able to select and pay for all Products, including Stored Value and Pass Products, and to transfer Products to another Account, subject to the limitations established in this Appendix 3.8, including in respect of Reduced Fare Group eligibility and Transaction Channel.

- 5.1.2.1 Manual top-up. The System shall permit a User to top-up his or her Registered Account manually through individual, one-time transactions.
- 5.1.2.2 Users shall not be able to view or purchase Products for which they are ineligible. For example, an Account which has not been approved for Reduced Fare Group eligibility shall not be allowed to purchase a Product Configured to be restricted to a Reduced Fare Group.
- 5.1.3 Travel and service history. Users shall be able to view travel and service history, including interactions, locations, dates/times and Fares charged, updated at least daily.
 - 5.1.3.1 Users shall be able to correct missing Taps, subject to the MBTA Fare Policy.
 - 5.1.3.2 Each Tap shall include a description of the Fare calculation, as defined by Appendix 3.7. The descriptors displayed to the User shall be Configurable by the MBTA.
 - 5.1.3.3 Users must be able to request deletion of travel and service history (with such deletion handled as defined in Appendix 3.1A), and the System shall bring about such deletion, subject to Configuration and in accordance with Appendices 3.1 and 3.1A.
- 5.1.4 Request replacement for defective Fare Card. The System must permit the replacement of a defective Fare Card via the System Website and Customer Support Software.
 - 5.1.4.1 The System shall immediately stop accepting for travel any Fare Card reported as damaged and must prevent misuse and fraud as described in this Appendix 3.8 and elsewhere in the Technical Requirements.
- 5.1.5 The System shall provide functionality for Users to request (for example, on a self-service basis through the System Website, and assisted by an agent through the Customer Support Software), to upgrade from a Temporary Fare Card to a Standard Fare Card as required in Appendix 2.6, and the SI shall fulfill that order in accordance with the requirements of Appendix 4.4.
- 5.1.6 Access payment history. The System shall allow the User to view current Product purchases, charges for travel, charges for Integrated Services, Refunds and adjustments.
 - 5.1.6.1 The System shall permit a User to query and/or display the reason a Product was denied and provide remedies to allow or enable the Product to be used.
 - 5.1.6.2 The System shall provide a receipt to a Registered User for purchases. This must meet Payment Industry Standards for receipts.
 - 5.1.6.3 The System shall permit a User to dispute incorrectly charged Fares and request a Refund or review. Such a dispute shall both simultaneously notify the MBTA and shall serve as a reported Problem for purposes of the SI's responsibilities under Appendix 3.6.
- 5.1.7 Convert Stored Value to a Pass Product. Users shall be able to specify a Pass Product to be purchased when a specified Value is reloaded at a Retail Reload Location.
- 5.1.8 Account enquiries. The System shall support Users in making enquiries about their Accounts, including but not limited to orders and charges. Account, Media and Contact (for Registered Users only) details should be automatically pre-filled, and the User shall not be required to reenter any Data already in the System.
- 5.1.9 Repay negative Account Balance. The System shall support Users in repaying a negative Account Balance, subject to write-off handling described in Section 1.8.
- 5.1.10 Participate in discounts and promotions. The System shall support Users' participation in discounts and promotions if and as permitted by Fare Policy, as further described in Appendix 3.7.
 - 5.1.10.1 The System shall support promotional or third party sponsored Fares by enabling validation and processing of authorized and active MBTA discount codes entered by the User.

- 5.1.10.2 For each Tap subject to a discount, details of the discount, including the amount and reason, shall be displayed with the User's travel and service history as described in Section 5.1.3 of this Appendix 3.8.
- 5.1.11 Access Inspection history. The System shall support Users in viewing Inspections and violations associated with their Account.
- 5.2 Additional Account Management Functionality for Registered Accounts.

In addition to the functionality described above, Registered Accounts should also support:
- 5.2.1 Create Profile. The System shall enable the Registered User to create a Profile as described in Section 2 of this Appendix 3.8.
- 5.2.2 Manage PII. The System shall support Registered Users to create, view, delete and update PII associated with the Account.
- 5.2.3 Manage multiple Media. The System shall support the Registered User in managing his or her options for one or more Credentials.
 - 5.2.3.1 The System shall allow a Registered User to associate one or more Credentials with a Registered Account, including any Credential, except:
 - 5.2.3.1.1 That a Credential can only be associated with one Registered Account at a time, and
 - 5.2.3.1.2 That an Account cannot have both a Fare Card and a Contactless EMV Credential associated, and
 - 5.2.3.1.3 That Credentials must be compatible with the Registered User and compliant with MBTA Fare Policy and Configuration; for example, Credentials issued to MBTA employees must not be associated to retail customer Registered Accounts, and
 - 5.2.3.1.4 That Credentials which are blocked from further use in the System by virtue of reaching a write-off/negative balance status cannot be associated with an Account.
 - 5.2.3.2 The System shall enable and require the Registered User to designate up to one Credential as the primary Credential. If only one Credential is associated with the Account, it shall be automatically designated by the System as the primary Credential. Only that Credential shall be accepted for travel. The System must have Configurable limits on how frequently Users can change the primary Credential to prevent fraud and implement MBTA Fare Policy.
 - 5.2.3.3 For each Credential linked to the Registered User's Account, the System shall allow a Registered User to view the status (Activated or not, Enabled or not, otherwise prevented from further use in the System).
 - 5.2.3.4 The System shall enable a Registered User to disassociate a Credential from the Registered Account as long as the Account does not have a negative Account Balance; the System must take into account pending charges and travel in making this determination. The Credential shall at that point be treated as associated with a new Unregistered Account. Enablement status (that is, whether whatever fee set out in Fare Policy to enable the Credential for use for travel has been paid, if applicable) shall transfer with this disassociation.
- 5.2.4 The System shall enable the Registered User to transfer Stored Value or unused Pass Products from one Account to another.
- 5.2.5 Store payment information. The System shall permit a Registered User to save payment information and select from saved payment options when purchasing Products.
 - 5.2.5.1 Stored payment information shall include but not be limited to credit card/bankcard number and expiration date, electronic fund transfer and third party payment applications.

- 5.2.5.2 Stored payment details shall not be fully visible to the User or the Alternate. For example, the System may show card type and last four digits, but not the full card number.
- 5.2.5.3 The System shall permit a Registered User to designate a stored payment option as a backup payment method.
- 5.2.6 Manage Automatic Charges
 - 5.2.6.1 Backup payments. The System shall permit a Registered User to authorize the System to automatically charge one of its stored payment options as a backup payment method the Fares associated with Trips beyond the limits of the Registered User's Product (for example, for Extension Fares).
 - 5.2.6.2 Automatic top-up. The System shall permit a Registered User to direct the System to automatically add Value from a defined stored payment method to the Registered Account based on a User-specified date, frequency, or Account Balance threshold.
 - 5.2.6.3 Automatic renewal. A Registered User shall be able to configure a Pass Product for automatic renewal upon its expiration date.
 - 5.2.6.4 Make changes for a future month. A Registered User shall be able to request changes/modifications to a Pass Product or Value for a future month, end participation, and other similar changes/modifications.
 - 5.2.6.4.1 Changes for future months shall be allowed up until the date when the Account would be charged for the Product, as further described in Appendix 3.6.
- 5.2.7 Fare Card request. The System shall enable a User to request/order a Fare Card to be mailed to him/her. The System must permit and promote on the System Website a combined transaction that requests this and creates the Registered Account.
 - 5.2.7.1 Fare Cards shall be inactive when mailed and the System shall enable the User to verify receipt of a Fare Card to activate for use.
 - 5.2.7.2 The System shall support payment for the enablement of the new Fare Card, if and as specified by the MBTA through Fare Policy.
- 5.2.8 Loss protection. The System shall support reporting, deactivation and replacement of lost/stolen Media and damaged Fare Cards.
 - 5.2.8.1 Registered Users shall be able to report a piece of Media as lost/stolen or a Fare Card as damaged and request a replacement Fare Card or link a new piece of Media in its place.
 - 5.2.8.2 Registered Users shall be able to transfer Products to the replacement Media.
 - 5.2.8.3 The System shall immediately stop accepting for travel any Media reported as lost, stolen or damaged.
 - 5.2.8.4 The MBTA shall be able to Configurably allow enablement status (that is, whether any required Enablement Fee has been paid) to transfer to the new Fare Card. In this case, the replaced/removed Fare Card shall be treated by the System as associated with a new Unregistered Account and shall no longer be treated as having its Enablement Fee paid.
- 5.2.9 Group membership. The System shall permit a Registered Account to be associated with a Group or Reduced Fare Group, such as blind/visually impaired individuals, senior citizens, or other identified categorizations according to MBTA Fare Policy, subject to verification.
 - 5.2.9.1 View Groups. The System shall display to the Registered User a list of all Groups his/her Account is linked with.
 - 5.2.9.2 Request to join Group. A Registered User shall be able to indicate that he or she is a member of a Group whereupon the System shall send an email or other notification to the Group Administrator.

- 5.2.9.3 Request to leave Group. A Registered User shall be able to indicate that he or she is no longer a member of a Group whereupon the System shall send an email or other notification to the Group Administrator.
 - 5.2.10 Event notifications. The System shall create and send email and text message (SMS) notifications of events associated with the Registered User's Account.
 - 5.2.10.1 Notifications shall comply with Privacy Laws and Appendix 3.1 and follow current industry standards and best practices.
 - 5.2.10.1.1 Text message (SMS) notifications must comply with applicable notice and choice regulations and laws.
 - 5.2.10.1.2 Email notifications must comply with the CAN-SPAM Act.
 - 5.2.10.2 The Registered User shall be able to specify the preferred formats (email or SMS) and contact details (email address or mobile phone number) for each type of notification.
 - 5.2.10.2.1 The email addresses and mobile phone number options shall come from the contact details provided in the User Profile.
 - 5.2.10.2.2 The System shall enable a Registered User to authorize particular notifications to be sent to the Account Alternate's email address or mobile phone number.
 - 5.2.10.2.3 Each event notification shall be sent only in the format(s) and to the contact(s) set in the User's Profile.
 - 5.2.10.3 The Registered User shall be able to select the particular events about which to receive notification. Event notifications shall not be sent if the Registered User opts-out of the notification(s).
 - 5.2.10.3.1 A notification shall be sent if a Registered User's Media is near its expiration date.
 - 5.2.10.3.2 User Optional Notifications. Registered Users shall be able to opt-in for periodic Account statements and notifications of: Taps, Payment, Account modification, Media denied (or that may be denied on next usage), a period during which there are one or more Taps, to monitor against fraud.
 - 5.2.10.4 User Required Notification. The system shall automatically send the following notifications to Registered Users unless the Registered User opts out of such notification: Confirmation of Account registration, changes/modifications to Profile, changes to Profile Data, adding/deleting an Alternate; joining/leaving a Group, Payment confirmations, new Fare Card mailed, negative Account Balance notification and reminder, and Registered User-requested emails. Request replacements. The System shall support Registered User requests via mail, System Website, and Customer Support Software for replacement Fare Cards. The System shall support MBTA Fare Policy and other Technical Requirements regarding eligibility for replacements and shipping costs.
 - 5.2.11 Linked Integrated Services. The System shall enable a Registered User to view and delete links made in their Account to Integrated Services as described in Appendix 3.9.
 - 5.2.12 Add Value for Integrated Services as described in Appendix 3.9. Integrated Services Information must be accessible and displayed.
 - 5.2.13 Personalized preferences. The System shall enable a Registered User to set User Established Customizations, including language and Accessibility.
- 5.3 Account Management Functionality for Administrator Accounts
Administrator group permissions shall be Configurable to grant permission to Administrator Accounts to perform any or all of the Account Management functions supported for Customer

Accounts on behalf of a Registered User, Unregistered User, or Alternate. Administrator Accounts shall also be Configurable to provide the following Account management functionality:

- 5.3.1 Customer lookup. Administrator Accounts shall be able to search using name, Media identifier, email, phone number or linked account number. A single search field or a combination of search fields may be populated.
- 5.3.2 View Account details. Administrator Accounts shall be able to view Account details in accordance with their Configured permissions and Appendix 3.1A.
- 5.3.3 Create new User. Administrator Accounts shall be able to create new Registered Accounts and Unregistered Accounts.
- 5.3.4 Billing. Administrator Accounts shall be able to generate and download billing data for a Group based on actual usage by its Registered Users associated with that particular Group and/or Groups as described in Appendix 3.7.
 - 5.3.4.1 Multiple billing subgroups. The System shall enable multiple, different billing subgroups within a single Group.
- 5.3.5 Group and Reduced Fare Group membership management.
 - 5.3.5.1 Group membership authorization. Administrators shall be able to authorize membership to a Group or Reduced Fare Group. If the Administrator verifies and approves the designation, the Registered User will then be then placed into and associated with that Group. Group membership authorization shall enabled by:
 - 5.3.5.1.1 Approving a request submitted by a Registered User.
 - 5.3.5.1.2 Entering the name and Credential number of an existing Registered User.
 - 5.3.5.1.3 Creating a new Registered User Account on behalf of a User.
 - 5.3.5.2 Group membership re-authorization. An Administrator shall be able to re-authorize an expiring or expired membership to a Group or Reduced Fare Group.
 - 5.3.5.3 Group member removal. Administrators shall be able to authorize a User's removal from a Group or Reduced Fare Group or Group Account by.
 - 5.3.5.3.1 Approving a request submitted by a Registered User.
 - 5.3.5.3.2 Entering the name and Credential number of an existing Registered User.
 - 5.3.5.4 Membership expiration settings. Administrator Accounts shall be able to set expiration dates for each Group and Reduced Fare Group. The settings shall be Configurable for each Reduced Fare Group and shall accommodate fixed dates (e.g. June 30th), specified time periods (e.g. 12 months from date of approval) and no expiration date.
- 5.3.6 Process Fare Card replacement. Ability to view and process User requests for replacement Fare Cards, including the ability to place or lift a hold on a lost/stolen Fare Card, associate the new Fare Card with an existing Registered Account and track the status of the replacement.
- 5.3.7 Request Fare Card bulk orders. An Administrator shall be able to request bulk orders of Fare Cards as further described in Appendix 4.4.
- 5.3.8 Fulfill Group orders. An Administrator shall be able to fulfill orders placed by Groups using the method described in Appendix 4.4 for direct fulfillment by MBTA and the third party Group program Administrator.
- 5.3.9 Lookup and manage orders. Administrator Accounts shall be able to lookup existing orders (including individual and bulk orders), view the status and cancel orders up until the date when the order is charged for, as further described in Appendix 3.6.
- 5.3.10 Disable or suspend Accounts or Credentials. An Administrator shall be able to disable or suspend: (i) an individual Credential, (ii) an entire Registered Account and all associated Credentials; or (iii) some or all Accounts or Credentials in a Group via a batch request.

- 5.3.11 Allow pass-backs. An Administrator shall be able to authorize an Account for circumvention of Anti-Passback Controls, as described in Appendix 3.7. The System must accurately compute Fares for all travel taken and charge the appropriate Account.
- 5.3.12 Administrators shall be able to find and troubleshoot issues related to Accounts and Credentials blocked from further use in the System (e.g. due to a negative Account Balance), and take steps to permit use of the Credential within the System, including by collecting amounts due or making a note of a customer service exception. Exceptions shall be clearly noted on an audit log and shall Configurably notify another Administrator.
- 5.3.13 Manage Accounts within Group. The System shall support multiple options for management of Group-assigned User Accounts, including:
 - 5.3.13.1 The System shall accept a user-friendly file transfer with a list of Group members, the selected Pass or Value amount, the User's Credential number, and other Data required by the IRS, Group Administrator, and/or the MBTA.
 - 5.3.13.1.1 The System shall allow for the frequency of the file transfer to be configurable and set per Group, and be as frequent as weekly.
 - 5.3.13.2 The System shall allow an on-demand download by the Group of a file containing the current and prior Group members, status in the Group, products assigned, dates when products will take effect, and other data to allow the Group to confirm the financial and travel entitlement status of the Group Account and its members.
 - 5.3.13.3 The System shall allow a Group to manually enter User Accounts and add associated Products. The System shall have the capacity to enable this functionality to be:
 - 5.3.13.3.1 Frequently accessed, used and processed by Groups encompassing a small volume of assigned/associated Accounts.
 - 5.3.13.3.2 On an ad-hoc basis during the month for large Groups (making changes during the month, such as a hiring or termination, or to correct errors).
- 5.3.14 Manage Transit Benefits. The System shall provide functionality for an Administrator Account to managing Transit Benefits as further described in Section 4.9 of this Appendix 3.8, including:
 - 5.3.14.1 Reporting on the total unexpended value of Transit Benefits for the month for each Group;
 - 5.3.14.2 Providing a report for reconciliation of funds for each Group.
 - 5.3.14.3 Performing administrative tasks required to sponsor Transit Benefits including setup, processing and auditing.
- 5.3.15 Authorize refunds. The System shall provide functionality for an Administrator Account to authorize MBTA Discretionary Refunds, as described in Appendix 4.4.
- 5.3.16 Batch requests. The System shall provide functionality for an Administrator Account to make batch requests as further described in Appendix 4.4.
- 5.3.17 Manage Administrators. The System shall support an Administrator Account in managing Administrator access and permissions by allowing:
 - 5.3.17.1 Configuration of Administrator groups. An Administrator shall be able to create Administrator groups and assign permissions to all members of the group.
 - 5.3.17.1.1 All Administrator Accounts assigned to an Administrator group shall inherit permissions granted to that group.
 - 5.3.17.1.2 The System shall support a single Administrator Account belonging to multiple Administrator groups.
 - 5.3.17.2 Configuration of Administrator Accounts. An Administrator shall be able to create Administrator Accounts and assign each Account to one or more Administrator groups.

- 5.3.17.3 An Administrator can only grant access to another Administrator equal to or less than his or her own.
 - 5.3.17.4 MBTA and its configured Administrators shall be able to manage Administrator accounts across all other organizations. No Administrators other than the SI and MBTA shall be able to manage MBTA Administrator Accounts.
- 5.4 The Proposal shall include a description of the Account management features. The Account management features Documentation shall be kept current throughout the Term as new features are added. The Account management features Documentation shall include:
- 5.4.1 A detailed list of all Account management features, including a description of each feature and diagrams of feature relationships.
 - 5.4.2 A matrix of feature availability based on User type (Registered Account Users, Unregistered Account Users, Authorized Alternates, MBTA Users, SI Users, Group Administrators, third party Group program Administrator, call center agents and Reduced Fare Group Administrators) and Sales Channel (System Website, Customer Support Software, Fare Vending Machines, Retail Reload Locations).
 - 5.4.3 Screenshots showing what it looks like when Account management features are accessed via the Sales Channels, including the System Website, Customer Support Software and Fare Vending Machines. In the proposal, these screenshots can be from other transit systems. During the Term, they shall be updated to show screenshots from the System.
 - 5.4.4 An explanation of any limitations to Account management functionality availability by Sales Channel.
 - 5.4.5 A description of how Account management features would address atypical scenarios. In the proposal, this shall be based on the SI's experience in other transit systems. During the Term, it shall be updated to include scenarios encountered in the System.
 - 5.4.6 A description of how User Established Customizations will be used to customize the User Interactions with the System.
 - 5.4.7 A description of how a User would request deletion of travel and service history and how the SI would handle such a request.
 - 5.4.8 A list of event notification types and sample message content for MBTA review.
[PSR: Account management features] [CDRL: Updated Account management features]

6. Account Management Interfaces

The System shall support Account management through the Account Management Interfaces, including the System Website, Customer Support Software, and Fare Vending Machines.

6.1 Features

- 6.1.1 All Account Management Interfaces shall provide payment Functionality detailed in Appendix 3.6 and shall comply with Payment Industry Standards and Appendix 3.1.
- 6.1.2 Fare Vending Machines shall provide limited Account management functionality as described in Appendix 2.3.
- 6.1.3 The System Website, Customer Support Software shall provide all Account management features detailed in this appendix and Appendix 3.9. Each of these must generally provide the same services.
- 6.1.4 The System shall be able to require first-time Users of the System Website, Customer Support Software, to accept terms and conditions Configured by MBTA, and when those terms and conditions change.

6.2 Security and Privacy

The Account Management Interfaces must comply with Appendices 3.1 and 3.1A.

6.3 Performance

In order to be considered Available, all Account management tools must respond to standard queries (including Account details, travel history, purchase history, and Product transfer history) within three (3) seconds 90% of the time, and within ten (10) seconds 99% of the time. The System Website and Customer Support Software shall be scalable for both gradual increases and peaks in usage as described in Appendix 3.1.

6.4 Usability

6.4.1 The Account Management Interfaces shall be designed to help prevent errors. Account Management Interfaces shall:

6.4.1.1 Provide helpful error messages when appropriate. Error messages shall:

6.4.1.1.1 Be visible, conspicuous, and highly noticeable.

6.4.1.1.2 Be in plain language.

6.4.1.1.3 Be precise and polite in their description of the issue/problem.

6.4.1.1.4 Provide constructive advice on how to fix the issue/problem.

6.4.1.2 Preserve as much of the User's work as possible. The Account management interfaces shall be designed to make error situations less unpleasant for Users by preserving as much of the user's work as possible and minimizing the effort required to fix errors.

6.4.1.3 Support options to undo, redo or cancel an input. The Account management interfaces shall provide Users with options to correct unintended actions through the use of a cancel command, a back button, an undo function, a main menu selector, or similar.

6.4.1.4 Confirm irreversible actions with the User. The Account management interfaces shall present a confirmation dialog to the User before completing actions which are irreversible and/or will have a major impact on the Account. For example, removing a Credential from the Account.

6.4.1.5 Provide an option to extend time out period. Prior to timing out, Account management interfaces shall provide the User with an option to extend his/her session.

6.4.1.6 Provide the option to contact or connect to a call center agent after several errors.

6.4.2 The Account Management Interfaces shall support the sale of Zone-based Stored Value Products and Pass Products without requiring the User to know what Zone he/she is traveling from/to.

6.4.3 The Account Management Interfaces shall, in a single User Session, support:

6.4.3.1 Payment of an Enablement Fee and purchase of a Product.

6.4.3.2 Purchase and transfer of multiple Products. Except as provided in Appendix 2.3 in respect of Fare Vending Machines, Account Management Interfaces shall support purchase and transfer (from one Account to another) of multiple identical or different Products in a single User Session.

6.5 Testing

6.5.1 The SI shall conduct user testing of the Account Management Interfaces as described in Appendix 2.16.

6.6 Browsers and Operating Systems

Web-based interfaces, including the System Website and Administrator Interface shall be supported by browsers and operating systems (OS) most commonly used by Users.

6.6.1 The System Website and Administrator Interface shall be fully functional and consistent in latest browser and OS versions.

- 6.6.2 Key functionality shall also be supported in legacy browser and OS versions still in use by a significant percentage of Users.
 - 6.6.3 In respect of and in totality between the prior two requirements, at least 99.5% of Users attempting to access the System Website shall be able to make use of most System Website functionality; if this is not the case, the SI must expand support to more platforms and/or versions.
 - 6.6.4 The SI shall, in its Proposal, develop a browser and OS support matrix which indicates the levels of support for each browser/OS version in use.
 - 6.6.5 In developing, maintaining, and upgrading said support, SI shall draw browser and OS usage data from the most current MBTA.com website analytics, and also from the System Website once live. A current analytics report is provided in Appendix 3.8 Attachment 1 (MBTA.com Website Analytics).
 - 6.6.6 Because these numbers continuously change when old browsers become obsolete and newer versions are released, the SI shall analyze traffic and update the browser and OS support matrix prior to developing the System Website and Administrator Interface.
 - 6.6.7 The SI shall thereafter update the support matrix annually and as required by major releases using the most current website analytics available at the time of the update drawing from both the System Website and MBTA.com.
- 6.7 System Website
- 6.7.1 The SI shall develop the System Website and operate and maintain it during the Term, including continuing development, updates, patches, and general maintenance. The MBTA may assume the operation, hosting and maintenance of the System Website, and the SI must facilitate that transition if requested by MBTA; this shall be treated as a Configuration capability. Prior to Installation, upon request, and at Handback, the SI shall produce to the MBTA all Source Code, APIs, Documentation, and other necessary intellectual property and information. [CDRL: Website Source Code and Documentation] [CDRL: Updated website Source Code and Documentation]
 - 6.7.2 In general, any User is eligible to use the System Website and the SI shall not prevent any User from using the System Website, except to comply with the access control requirements of Appendix 3.1.
 - 6.7.3 The System Website shall be developed to include a website API to support all website and Account features as described in Appendix 3.9.
 - 6.7.4 The System Website shall:
 - 6.7.4.1 Be optimized for mobile devices, including smartphones and tablets, and responsive for desktop computers.
 - 6.7.4.2 Be designed to ensure that everyone, including Users who have difficulty seeing, hearing, and making precise movements, can use it. The SI shall ensure that the System Website complies with Accessibility requirements described in Appendix 2.9.
 - 6.7.4.3 Have a high rate of uptime and scheduling any downtime or releases for off-peak hours (as described in Appendix 4.6 and Appendix 8). The System Website shall display informative messages to users during both planned and unplanned downtime. The SI shall notify the MBTA of planned downtime in advance and unplanned downtime in arrears.
 - 6.7.5 The System Website shall integrate seamlessly with the main MBTA website (MBTA.com) and reflect the AFC 2.0 brand through:
 - 6.7.5.1 Consistency with the main MBTA website's visual design.
 - 6.7.5.1.1 The current website is under redesign, with the future website published at beta.mbtacom. The MBTA expects the beta site to

- become the main MBTA website prior to the Date of Award. The System Website shall adhere to the MBTA Tech Style Guide, which is a living document published at beta.mbta.com/style_guide (when the beta site goes live this URL will change to www.mbta.com/style_guide).
- 6.7.5.1.2 The SI shall provide two refreshes to the System Website visual design and navigation during the Term.
 - 6.7.5.2 Consistency with the main MBTA website's navigation.
 - 6.7.5.2.1 The System Website shall utilize the standard header and footer from the main MBTA website, including links for the website's privacy policy, tracking policy, and terms of use.
 - 6.7.5.2.2 Providing an obvious way for Users to report technical problems through the standard MBTA customer contact form.
 - 6.7.5.2.3 Displaying an MBTA.com URL, optionally using a subdomain. The SI shall coordinate with MBTA staff to configure the URL.
 - 6.7.5.2.4 Supporting deep linking from MBTA.com to all specific functions on the System Website. Deep links shall support, for example, the publication of Product information on MBTA.com with direct links to purchase specific Pass Products. The SI shall provide a list of direct links to all System Website functions. [CDRL: List of direct links to System Website functions]
 - 6.7.5.3 Including and supporting analytics tracking code to be provided by the MBTA to enable comprehensive usage reporting.
 - 6.7.5.4 Consistency with the AFC 2.0 Brand Style & Use Guide, which the MBTA will provide to the SI.
 - 6.7.6 The System Website shall be subject to Design Review as described in Appendix 7.
 - 6.7.7 The SI shall provide in its Proposal a conceptual design for the System Website, including:
 - 6.7.7.1 A summary of the planned development approach;
 - 6.7.7.2 Approach to website user testing which aligns with testing requirements in Appendix 2.16;
 - 6.7.7.3 Approach to refreshes of the visual design;
 - 6.7.7.4 Approach to website Accessibility compliance, including the Digital Accessibility Audit described in Appendix 2.9; and,
 - 6.7.7.5 Summary reports from tests conducted on similar existing Proposer-developed websites, if available.[PSR: System Website conceptual design]
 - 6.7.8 During the Technical Proposal evaluation, the Proposer shall provide a live, dynamic demonstration of a website developed for another client, shown on mobile, tablet, and desktop devices. [Technical Proposal Evaluation: Demonstration]
 - 6.7.9 The SI shall provide for Preliminary Design Review:
 - 6.7.9.1 Annotated wireframes, demonstrating the functionality to be developed. [CDRL: System Website wireframes]
 - 6.7.9.2 A style guide for the System Website which includes descriptions of the styles proposed for use, including fonts, logo, colors, sample language and iconography. It shall also include an explanation of how the styles align with the MBTA Tech Style Guide and the AFC 2.0 Brand Style & Use Guide, and provide examples of the styles shown desktop and mobile devices through screenshots and mockups. [CDRL: System Website style guide]
 - 6.7.9.3 A visual design mockup, demonstrating the application of the MBTA Tech Style Guide and the interface design; and

- 6.7.9.4 The browser and OS support matrix. [CDRL: Browser and OS support matrix]
[CDRL: System Website preliminary design]
 - 6.7.10 The SI shall provide for Final Design Review:
 - 6.7.10.1 Revisions of Submittals required in Preliminary Design Review as described in Section 6.7.9 of this Appendix 3.8.
 - 6.7.10.2 A beta version of the System Website which at a minimum shows navigation, key Account management functionality and is optimized for desktop and mobile devices.
 - 6.7.11 During functional and performance testing (as described in Appendix 2.16), the SI shall confirm that the System Website is fully compliant with all requirements (including those in Appendices 3.1, 3.1A, 3.1B and 2.9) and resolve all issues of non-compliance.
- 6.8 Administrator Interface
- The Administrator Interface shall provide all of the functionality described in Section 5.3 of this Appendix 3.8 and that provided by the legacy administrator interface. Information about the legacy administrator interface is included in the Reference Documents (see MBTA Institutional Programs and Account Management Tools). The Administrator Interface shall be subject to Design Review as described in Appendix 7.
- 6.8.1 The Administrator Interface shall be a web-based solution.
 - 6.8.2 The Administrator Interface shall authenticate Users.
 - 6.8.3 Any User Configured as an Administrator as defined in Section 5.3.14 is eligible to use the Administrator Interface and the SI shall not prevent any such User from using the Administrator Interface, except to comply with the access control requirements of Appendix 3.1.
 - 6.8.4 The Administrator Interface shall enable the Administrator Account to perform any action on behalf of Registered Users and Unregistered Users allowed in the permissions for its Administrator group, except with respect to access to Level 0 Data or Level 1 Data as described in Appendix 3.1A.
 - 6.8.5 The SI's Proposal shall describe the Administrator Interface, including the approach to Customer authentication, Administrator authentication and access control, and visibility of User Data. [PSR: Administrator Interface conceptual design]
 - 6.8.6 The SI shall use the information provided about the legacy administrator interface and the requirements of this Appendix 3.8 to develop a design specification for the Administrator Interface. [CDRL: Administrator Interface preliminary design]
 - 6.8.7 For Final Design Review, the SI shall provide an updated design specification for and a beta version of the Administrator Interface. [CDRL: Administrator Interface final design]
 - 6.8.8 The SI shall provide Documentation to support Administrators using the Administrator Interface prior to Installation. [CDRL: Documentation for Administrator Interface]
- 6.9 Customer Support Software
- The Customer Support Software shall support the MBTA call center in providing customer service for Users without internet access and for more complex questions.
- 6.9.1 The MBTA or an MBTA-designated third party, but not the SI or an SI Affiliate, will operate the call center and provide personnel to serve as live agents.
 - 6.9.2 Functionality
 - 6.9.2.1 The SI shall provide Customer Support Software, including an Administrator Interface, an IVR and the associated APIs.
 - 6.9.2.2 All Account Management features shall be provided by both IVR and the Administrator Interface unless otherwise noted.

- 6.9.2.3 All Customer Support Software orders shall meet payment processing requirements described in Appendix 3.6.
- 6.9.2.4 The SI does not need to support any website, Administrator Interface or IVR features for AFC 1.0 Media except for managing Balance conversion as described in Appendix 4.4.
- 6.9.3 IVR
 - 6.9.3.1 In general, any User is eligible to use the IVR and the SI shall not prevent any User from using the IVR, except to comply with the access control requirements of Appendix 3.1.
 - 6.9.3.2 Inputs. The Interactive Voice Response system (IVR) shall support self-service access to Account information and Account management functionality via phone through the use of voice and keypad inputs.
 - 6.9.3.2.1 The IVR shall not have a limit to the number of words recognized.
 - 6.9.3.2.2 The IVR shall support the use of teletype writing (TTY) and text-to-speech (TTS) devices for the hearing impaired.
 - 6.9.3.3 Menu options. In addition to the considerations described in Section 6.4 of this Appendix 3.8, the IVR shall:
 - 6.9.3.3.1 Include no more than five options in each voice menu.
 - 6.9.3.3.2 Provide the capability for a User to press a single key and have the last IVR prompt repeated.
 - 6.9.3.3.3 Provide the capability for a User to request help from anywhere on the IVR menus.
 - 6.9.3.3.4 Have the capability to re-prompt the user with a different message on on invalid or lack of response.
 - 6.9.3.3.5 Be interrupted when the User makes a selection while the voice command is being spoken.
 - 6.9.3.4 Connection to live agent. The IVR must support connecting the caller to a live agent to resolve a complex transaction.
 - 6.9.3.4.1 The IVR must minimize the occasions when the IVR must connect the caller to a live agent.
 - 6.9.3.5 The language in pre-recorded or dynamically generated audio shall align with the tone described in Appendix 2.3 Attachment 1 (MBTA Branding Guidelines) and follow the content style guide in the MBTA Tech Style Guide.
 - 6.9.3.6 The IVR shall include translations for languages in language group A, as described in Appendix 2.9.
 - 6.9.3.7 The IVR shall be subject to Design Review as described in Appendix 7.
 - 6.9.3.8 The SI's proposal shall describe the IVR, including any limitations in making Account Management functionality available via the IVR and the use of pre-recorded or dynamically generated audio. [PSR: IVR conceptual design]
 - 6.9.3.9 The SI shall provide for Preliminary Design Review:
 - 6.9.3.9.1 A matrix of Account management features, identifying whether they are supported by the IVR, the Administrator Interface or both.
 - 6.9.3.9.2 Call flow diagrams that explain how the Customer Support Software will handle common User enquiries, including but not limited to: checking Account balance, purchasing Products, reporting a lost/stolen Fare Card, adding a new stored payment method, and correcting a missing Tap.
 - 6.9.3.9.3 The full IVR menu.

- 6.9.3.9.4 An Explanation of how agents will retrieve queued calls from Users who pre-authenticated through the IVR.
[CDRL: IVR preliminary design]
- 6.9.3.10 The SI shall provide for Final Design Review updated Documentation from the preliminary design and a beta version of the IVR. [CDRL: IVR final design]
- 6.9.4 Administrator Interface
The Administrator Interface (described in Section 6.8 above) shall support operator-assisted Account management via phone through the use of a secure interface made available to MBTA live attendants.
- 6.9.5 Integration
The IVR shall provide a seamless experience for Users transferring between the MBTA call center and the IVR using the simplest possible technical approach.
 - 6.9.5.1 The System shall be integrated with the MBTA's existing call center phone number such that Users only dial one number to contact the MBTA whether their enquiry is related to the System or not. No telephone system integration is necessitated by this requirement beyond the ability for the IVR to receive calls transferred from the MBTA's call center telephone system, and to transfer calls to the MBTA's call center.
 - 6.9.5.2 The System shall support MBTA call center staff in responding to User enquiries by gathering information from the User before transferring the call, locating the User's Account and authenticating access to the Account. The System shall provide a method for MBTA call center staff to access these queued Accounts for customers who pre-authenticated via the IVR without using any direct telephone system integration.
 - 6.9.5.3 The SI shall not install any Software on any MBTA telephone system nor require that MBTA do so. The SI shall not install any equipment in the MBTA's call center nor modify the phones used in the MBTA's call center.
- 6.9.6 Documentation
The SI shall provide instructions, sample call scripts and initial assistance to the MBTA call center during the Pilots and the Transition Period, and when any updates are made to the Customer Support Software or Account management features. [CDRL: Customer Support Software support Documentation] [CDRL: Updated Customer Support Software support Documentation]
- 6.9.7 Administrative Point of Sales may be operated by the MBTA, using the Customer Support Software, augmented by the retail functionality described in Appendix 2.15. No additional Customer Support Software functions are required for these Administrative Point of Sales.

7. Account Data Timeliness Standards

- 7.1 The Account Data Timeliness Revenue Protection Standards are as follows:
 - 7.1.1 The System shall ensure that it shall not be possible that two transactions in the System, whether occurring simultaneously or sequentially, debit the same portion of an Account Balance; including that, for the avoidance of doubt, this means that an Account with \$10 Stored Value Account Balance shall not result for any moment in time in a \$5 Stored Value Account Balance following two \$5 transactions; the result shall be a \$0 Account Balance). This requirement shall apply instantaneously in all cases except:
 - 7.1.1.1 Within 120 seconds following acceptance of a Tap of a Credential at a Reader on a Vehicle or a Location other than a Station, the minimum possible Fare from the point of origin shall be treated as debited from the Account Balance and not be

- usable for any other transactions anywhere in the System, and that Tap shall be available to any Inspection Device; the actual Account Balance need not necessarily be updated for display purposes until the timeframes required in Appendix 3.7; and
- 7.1.1.2 Within 30 seconds following acceptance of a Tap of a Credential at a Reader at a Station, the minimum possible Fare from the point of origin shall be treated as debited from the Account Balance and not be usable for any other transactions anywhere in the System, and that Tap shall be available to any Inspection Device; the actual Account Balance need not necessarily be updated for display purposes until the timeframes required in Appendix 3.7.
 - 7.1.2 Transfer of Enablement status from one Fare Card to another shall be instantaneous and as such the System shall ensure that it shall not be possible for Enablement status to not belong to a Fare Card at any instant in time nor possible for Enablement status to be transferred from one Fare Card to multiple Fare Cards. The System shall ensure that it shall not be possible for a Fare Card to be in more than one Enablement status, even if the status is viewed through different System Elements.
 - 7.1.3 The System shall ensure that it shall not be possible for a unique discount code (as described in Appendix 3.8) to be used more than once.
 - 7.1.4 The System shall ensure that it shall be possible for a User to switch Credentials between Accounts (subject to Configurable limits) but that a Credential must never, for any period of time, be associated with more than one Account simultaneously nor treated as such by any System Element.
 - 7.1.5 Once a Credential is assigned to an Account as the primary Credential, the System shall ensure that such Credential must be usable throughout the System within 10 seconds.
 - 7.1.6 Immediately once a Credential is unassociated with any Account (or if the Credential was never associated with an Account), the System shall ensure that it shall not be usable in the System except to permit association to an Account.
 - 7.1.7 The System shall ensure that it shall not be possible to use a Fare Card anywhere in the System upon 30 seconds after notification to the System that a Fare Card has been reported lost or stolen.
 - 7.1.8 The System shall ensure that it shall not be possible to use an Account anywhere in the System upon 30 seconds after notification to the System that the Account should be suspended, and continuing until such suspension is lifted in a manner to be set by Configuration.
- 7.2 The Account Data Timeliness Customer Service Standards are as follows:
- 7.2.1 The System shall ensure that a User shall be able to use any Product purchased or Fare Card Enabled at an FVM at any Reader in a Gate or an AFC 1.0 Gate, and any Inspection Device shall consider the Product to have been purchased, within 10 seconds of the end of the User Session at the FVM.
 - 7.2.2 The System shall ensure that a User shall be able to use any Product purchased or Fare Card Enabled at an FVM at any Vehicle Validator within 30 seconds of the end of the User Session at the FVM.
 - 7.2.3 The System shall ensure that a User shall be able to use any Product purchased or Fare Card Enabled via the System Website, Customer Support Software or equivalent APIs, and that any Inspection Device shall consider the Product to have been purchased, within 10 seconds of completing the User Session.
 - 7.2.4 The System shall ensure that within 2 minutes from the time that a negative Account Balance issue is settled (including by a purchase, Product transfer, payment, MBTA Discretionary Refund, and Automatic Refund), the System shall, subject to Fare Policy and

- Configuration (including in respect of the minimum possible Configured Fare), accept a Tap associated with such Account.
- 7.2.5 The System shall ensure that a User shall be able to use, throughout the System, any Product purchased or Fare Card Enabled at a Retail Reload Location, and that any Inspection Device shall consider the Product to have been purchased, within 2 minutes of completion of the User Session at the Retail Reload Location.
- 7.2.6 The System shall ensure that, within 10 minutes of discovery of a Missing Tap or incorrect Fare, the SI shall provide to each User the financial benefit of any Automatic Refund. Once a debit or credit to the Account is made, the updated Account Balance shall be available for Use throughout the System within 10 seconds.
- 7.2.7 The System shall ensure that a User shall be able to use throughout the System any Product purchased using automatic top up features within 10 seconds following successful completion of payment or Authorization.

8. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.8. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.5, 3.1, 3.1B, 3.7 and 3.10. [PSR: Proposer team experience: System capabilities and information security]

APPENDIX 3.9

APPLICATION PROGRAMMING INTERFACES

The SI shall, as part of the System and in accordance with the Contract Standards, develop and make available Application Programming Interfaces (APIs) to provide for the use of System functionality through software and devices not provided by the SI. Such APIs shall be made available to the MBTA and to any third party designated in writing by the MBTA in connection with any Integrated Services in accordance with this Appendix 3.9.

The Proposal shall address the Technical Requirements set forth in this Appendix 3.9 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Application Programming Interfaces general approach]

1. General API Requirements

- 1.1 Application Programming Interfaces (APIs) shall be comprehensively documented, in a manner consistent with Good Industry Practice and including the content identified herein, and the resulting Documentation shall be provided to the MBTA. Documentation shall include:
 - 1.1.1 API element descriptions (where an API element is a package, class, function, method, parameter, or property, and the equivalent entities using different technical terms) in both narrative and technical formats that provide context for the role of each in the whole, examples of use in simple and complex cases (presented with progressively increasing complexity) that explain the functional use case and show the API use required;
 - 1.1.2 Encryption and security methods and recommendations;
 - 1.1.3 Preconditions for use of each API element;
 - 1.1.4 Transactions, rollback, orchestration/choreography;
 - 1.1.5 Protocols, languages, libraries, and versions that must be used; and
 - 1.1.6 Release notes, historically, and in advance of all changes, and as further described in Appendix 4.3.

[CDRL: API Documentation]

The SI's Proposal shall include an example of what practice and approach will be used as the model for the Documentation. [PSR: Model for API Documentation]

- 1.2 The SI shall develop and deliver a set of reference applications that use all of the APIs. The SI shall provide Documentation for the reference applications, which includes descriptions of the hypothetical business and operational scenarios in which the reference applications exist. [CDRL: Reference application Documentation]
- 1.3 The APIs shall be at least as performant and reliable as Devices when performing similar transactions, and the APIs shall offer at least the same range of transaction capabilities as Devices.
 - 1.3.1 The SI's Proposal shall include a plan for API performance, reliability and features. [PSR: Plan for API performance, reliability and features]
- 1.4 The APIs shall gracefully handle backwards compatibility to minimize impacts on API Users, maximizing support for prior versions of functionality.

- 1.5 The APIs shall be provided in non-revenue versions for use in the Model Office.
 - 1.5.1 The “proposed configuration mode” of the Model Office (described in Appendix 2.4) shall be Configurable at MBTA request to use upcoming versions of the API to allow Integrated Services administrators to test.
 - 1.5.2 In the Model Office, the APIs shall not deduct actual Value from any Account, Payment Card, ACH, or other Customer form of payment except in the version of the System used for the Model Office.
- 1.6 Availability and Eligibility
The SI shall provide hosting and support for APIs and manage, as Configured by the MBTA, which APIs are available on the Internet. The MBTA shall also be able to Configure some APIs to be available only to the MBTA or only in the Model Office.
- 1.7 The APIs may not require use of proprietary libraries or plug-ins. The Proposal shall identify the standards and on which the APIs will be based (e.g. SOAP, REST, JSON). [PSR: Standards on which APIs will be based].

2. Integrated Services APIs

- 2.1 The System shall make available a set of APIs to allow use of System functionality for future MBTA business opportunities and operating models, described herein as “Integrated Services”, and provide API management functionality as set forth in Section 2.5.
- 2.2 These APIs are intended to allow such Integrated Services to leverage the closed-loop Accounts managed in the System as a payment platform. Integrated Services use cases include, for example, parking, paratransit, and ride-sharing integration.
- 2.3 Availability and Eligibility
 - 2.3.1 The Integrated Services APIs shall be made available to eligible Integrated Services on the Internet, and shall comply with the requirements of Appendix 3.1.
 - 2.3.2 As part of the Model Office, a test environment version of the Integrated Services APIs shall also be made available to eligible Integrated Services on the Internet, and shall comply with all the requirements for the Integrated Services APIs and the requirements of the Model Office, especially with respect to not handling actual MBTA revenue.
 - 2.3.3 Except as expressly provided in this Project Agreement, any person designated in writing by the MBTA in connection with an Integrated Service is eligible to use the APIs, and the MBTA and all MBTA Persons are eligible to use the APIs.
 - 2.3.4 The MBTA will require that all Integrated Services agree to terms and conditions similar to those in the Massachusetts Department of Transportation Developers License Agreement dated November 13, 2009.
 - 2.3.4.1 Web address:
https://www.massdot.state.ma.us/Portals/0/docs/developers/develop_license_agree.pdf
 - 2.3.5 Except as expressly provided in this Project Agreement, the SI shall not prevent an eligible Integrated Service (as provided in Section 2.3.3) from using the APIs. The SI may prevent an Integrated Service from using the APIs when that Integrated Service has caused an Incident to occur or the SI reasonably expects that the Integrated Service will cause an Incident to occur and has information to support that conclusion. The SI's conclusions regarding such risks shall be subject to reasonable MBTA review and approval, and such review shall not relieve the SI of its other obligations in Appendix 3.1. The SI may also

temporarily prevent an Integrated Service from using the APIs to comply with the access control requirements of Appendix 3.1.

2.4 APIs to be Provided

The System shall provide APIs and associated functionality that includes the following:

2.4.1 Pay API

The System shall provide a “Pay API” which allows the Integrated Service to request to use a linked Account (defined in Section 2.5.1 below) to pay for a Transportation Activity. The request must provide various properties about the Transportation Activity as required by Configuration (defined in Section 2.5.2 below) and the dollar amount of the request and an optional list of Pass Products that would be accepted; the System shall use all necessary System functionality to:

- 2.4.1.1 Confirm that the Account has sufficient Account Balance to cover the Pay API request in the same way as the System would approve a Tap (as described in Appendices 3.4, 3.5, and 3.7, for example), using similar Configurable capabilities as made available for Fare Policy (as described in Appendix 3.7);
- 2.4.1.2 Reply to the Integrated Service with a positive or negative determination and a unique identifier for a Pay API request;
- 2.4.1.3 Simultaneously adjust the Account Balance and any Products (including validating/consuming a Pass Product in the same manner as the System would do so for a Tap approved by the System, and deducting Stored Value) upon replying with a positive determination;
- 2.4.1.4 Allow the Integrated Service to request revision to the properties and amount of the initial Pay API request, and reply and act using the same process as set forth in Sections 2.4.1.2 and 2.4.1.3; if the revised request is for a greater amount and the Account does not have sufficient Account Balance, other properties shall not be updated either;
- 2.4.1.5 Make available functionality for the Integrated Service to request finalization of each initial Pay API request and to provide additional properties (as described in Section 2.5.2.2);
- 2.4.1.6 If a Pay API request is not finalized within a time limit Configured for that Integrated Service by MBTA (as described in Section 2.5.2.8 in this Appendix 3.9), reverse the initial Pay API request and its effects on the Account;
- 2.4.1.7 Retain expired Pay API requests (as defined in Section 2.4.1.6) in the System for reporting purposes in the same way as other sales transactions, as set forth in Appendix 3.1A; and
- 2.4.1.8 The Pay API shall never allow an Account Balance to become negative. Any Pay API transaction approved by the System which causes an Account Balance to become negative shall be treated as a Trip approved in a manner inconsistent with Fare Policy for purposes of Appendix 4.2 computations.

2.4.2 Tap API

A “Tap API” shall be provided by the SI to allow an Integrated Service to submit the equivalent information that the System would receive from a Reader for processing by the System as if the Tap were so received. The linked Account is used instead of a Fare Card or other Credential.

- 2.4.2.1 The Tap API shall return the same information that would be returned by a Reader to a Validator, including indication of approval or denial of Taps, reason for denial, any Account status warnings, all as further described in Appendices 3.3,

- 3.4, and 3.5.
- 2.4.2.2 Location Data shall be a required parameter for use of the Tap API, and shall be required in both descriptive text AND either latitude/longitude coordinates or by Transportation Network location identifier, and in accordance with the location Data standards set forth in Appendix 4.5.
 - 2.4.2.3 Service identifiers for the Transportation Services or Integrated Services specific to each service shall be required parameters for use of the Tap API, sufficient to identify the particular service the API User seeks to access. The method for structuring these identifiers shall be developed by the SI and subject to Design Review as set forth in Appendix 7. [CDRL: Tap API service identifier structure]
 - 2.4.2.4 An Integrated Service-provided identifier for the Tap source shall be required by the API.
 - 2.4.2.5 The date and time of the Tap event and the date and time the Tap is received via the API shall both be stored.
- 2.4.3 Query APIs
- 2.4.3.1 APIs shall be provided by the System to allow the Integrated Service to request Trip and Integrated Services API usage history for an Account for one or more Operating Days as Configured by MBTA (the “Query API”), and only if the User has opted-in to enabling use of that information in the manner set forth in Appendix 3.1A, and:
 - 2.4.3.1.1 Results, if any, shall include Integrated Services Pay API requests, Taps not yet processed into Trips, and Trips, with indication of the finalization status of each;
 - 2.4.3.1.2 Results shall not contain any Personally Identifiable Information;
 - 2.4.3.1.3 Results shall include location, time, Mode, and other identifying Data for the used whenever it is available; and
 - 2.4.3.1.4 Data about Product purchases shall not be included in the results.
 - 2.4.3.2 The query APIs shall allow the Integrated Service to retrieve Data about:
 - 2.4.3.2.1 All Integrated Services and service types,
 - 2.4.3.2.2 Other service types and similar attributes that will be encountered in the results provided pursuant to Section 2.4.3.1,
 - 2.4.3.2.3 All Products configured in the System, and
 - 2.4.3.2.4 Transportation Network identifiers for routes, Locations, Modes, and other Data needed to submit a complete Tap.
- 2.4.4 Reload API and Balance Check API
- 2.4.4.1 The System shall make available an API that allows reload/top-up of a linked Account and which returns confirmation of the transaction and Account balance information, and a similar API that simply allows retrieval of linked Account balance information (the “Reload API” and “Balance Check API” respectively).
 - 2.4.4.2 The Reload API shall not accept pass-through Payment Card or ACH payments from an Integrated Service nor a User.
 - 2.4.4.3 The System shall implement an API Funds Pool for each Integrated Service for purposes of settling funds to reload an Account using this API.
 - 2.4.4.3.1 Reloads shall only be applied to Accounts from Value in an API Funds Pool on a pre-paid basis. The System shall not perform Payment Card processing for transactions made using the Reload API.
 - 2.4.4.3.2 The System shall provide a method for Integrated Services to purchase Value for the API Funds Pool, check balance, receive notifications of low balance, and report on and extract Data about reloads processed.
 - 2.4.4.3.3 Purchase of Value for an API Funds Pool shall, at a minimum, be

accepted from Integrated Services using ACH payments. The API Funds Pool shall be implemented in a manner consistent with the requirements in Appendix 4.7.

- 2.4.4.3.4 None of the Data made available to Integrated Services as part of the API Funds Pool reports or extracts shall include any Personally Identifiable Information as defined in Appendix 3.1A.

2.5 API Management Functionality

The System shall also provide the following specific API management functionality:

- 2.5.1 API functionality for an Integrated Service to request and receive a unique, persistent identifier for an Account, which, when successful, creates a link between the Account and the Integrated Service.
 - 2.5.1.1 Support at least two mechanisms for authenticating:
 - 2.5.1.1.1 Support locating an Account using an Integrated Service identifier that the User has pre-configured in an Account, with no additional authentication needed, and
 - 2.5.1.1.2 Using the Internet Engineering Task Force OAuth standard for authentication and security to a User Profile, allowing the User to choose an Account.
 - 2.5.1.2 When linking an Integrated Service to an Account, support at least three levels of access, which the System shall require be specified in the request from the Integrated Service, which must be constrained by MBTA Configuration for that Integrated Service (in Section 2.5.2.10) and which the System shall display to the be User to confirm during the authentication process (when using OAuth):
 - 2.5.1.2.1 Pay/Tap, and query,
 - 2.5.1.2.2 Pay/Tap only, and
 - 2.5.1.2.3 Query only.
- 2.5.2 MBTA shall be able to Configure:
 - 2.5.2.1 Each Integrated Service, including defining activating and deactivation dates, which shall be honored by the APIs;
 - 2.5.2.2 Properties which may be populated and shall be populated for each Transportation Activity and each Integrated Service for an initial Pay API request and a final Pay API request;
 - 2.5.2.2.1 This Configurability requirement shall permit the MBTA to, for example, define whether a “start location” must be specified in a Pay API request from a particular Integrated Service and an “end location” must be specified in a finalization request;
 - 2.5.2.2.2 The SI shall demonstrate the capability of the System to support Configurability of such properties for each Transportation Activity and each Integrated Service, and shall be responsible for implementing such Configuration. When such Configuration requests exceed the limits provided in Appendix 4.3 in respect of Pay API properties, such Configuration shall be an MBTA Change.
 - 2.5.2.3 A catalog of Transportation Activities provided for each Integrated Service, which shall have a set of Integrated Service category options that are related to allowable Payment Industry Standards;
 - 2.5.2.4 Which properties for each Integrated Service and Transportation Activity appear on Account detail and in internal-facing reports;
 - 2.5.2.5 How properties used in this context relate or map to properties commonly used in the System (e.g. “trip start location” relates to “parking lot location”) for reporting

- and data warehouse purposes;
- 2.5.2.6 Maximum number and amounts for each Integrated Service at the Pay API request level, customer-day level, and overall day level;
 - 2.5.2.7 Whether and to what extent to delay expiration of unfinalized Pay API requests if API availability is degraded;
 - 2.5.2.8 The maximum time period for finalizing Pay API requests for each Integrated Service before expiration in either (a) simple duration/minutes or (b) to end of service day plus an offset in days and minutes;
 - 2.5.2.9 The Operating Day date range (relative to the current Operating Day) that each Integrated Service is permitted to query; and
 - 2.5.2.10 Which access levels each Integrated Service is allowed to request, and what the default access level is for non-interactive (non-OAuth) links.
- 2.5.3 Daily reports of sales and Trip activity as set forth Appendix 3.7 and the data warehouse External Interface described in Appendix 3.10 shall include approved Integrated Services activity along with Taps and Trips approved and indicate which Integrated Service was used along with the Product that was used to approve it. [CDRL: Integrated Services activity]
- 2.5.4 MBTA shall have the ability to temporarily suspend Pay API request expirations as Configuration.
- 2.5.5 The System shall allow Users to view and delete links made in their Account, and to view and remove all Integrated Services identifiers, with the restriction that already-initiated Pay API requests are still honored and can be revised and finalized until the expiration time limit applicable at the time the Pay API request was initiated.
- 2.5.6 The System shall have functionality to generate and track API keys for each Integrated Service by the MBTA and by authorized Accounts created for each Integrated Service administrator by the SI at MBTA's request. Integrated Service Identifiers shall only be queryable by holders of a key for that particular Integrated Service. API keys shall be made available in a manner consistent with Good Industry Practice.
- 2.5.7 All API uses must be tied to a valid API key (provided as set forth in Section 2.5.6); no use of the API shall be allowed by the System without one.
- 2.5.8 The System shall be Configurable to allow disabling of API keys by MBTA or an Integrated Service administrator.
- 2.5.9 The System shall have Internet-facing tools for Integrated Service administrators for API key management, and which contains the API Documentation; the web-based tools shall comply with all the requirements of Appendix 3.8; the web portal shall also provide Integrated Services administrators with detailed reports about API usage by API key; these reports shall not reveal any PII (as defined in Appendix 3.1A).
- 2.5.10 The System shall provide a notification capability for the Integrated Service to be informed that an initial Pay API request has expired.
- 2.5.11 The System shall provide a notification capability for the Integrated Service to be informed that a linked Account has been unlinked.
- 2.5.12 The System shall provide tools and data for the MBTA to analyze, report on, and extract data about API usage by Integrated Service and API key, including data structured in such a way as to facilitate potential MBTA billing for use of API services.

3. Reader APIs

- 3.1 The System and SI shall make available a set of APIs and business processes to allow devices and software not provided by the SI to use a Reader provided by the SI pursuant to Appendix 2.8.

- 3.2 The SI shall provide Documentation (as set forth in Section 1.1) and an implementation guide for the Reader APIs. The implementation guide shall explain how to interface the SI-provided Reader unit to a reference device (e.g. a basic embedded PC) not provided by the SI. [CDRL: Documentation and implementation guide for Reader APIs]
- 3.3 The SI shall provide one (1) demonstration implementation using that reference device and a Reader and make it available in the Model Office, and shall provide a demonstration to the MBTA that the reference device successfully operates all the Reader functions that a Validator otherwise could. [CDRL: Demonstration implementation of Reader API]
- 3.4 Separately, the SI shall sell Readers to the MBTA as set forth in Appendix 2.8 and offer integration support and information services to third parties at the request of the MBTA.
- 3.5 The Reader APIs shall provide full coverage of all entities, attributes and methods used to interface SI-provided Gates and Validators to the component Reader. Regardless of whether the SI uses the APIs to connect SI-provided Gates and Validators to the Reader, the SI shall make available the API in such a way that it covers all functionality that would have been needed to connect the SI-provided Gates and Validators to the Reader using the API.
- 3.6 For purposes of Section 3 of this Appendix 3.9, the Reader is defined as inclusive of whatever CN Services are needed to connect the Reader to other System Elements. The Reader API shall verify with the Reader that communication to the System is taking place securely over the Communication Network defined in Appendix 2.5; the API shall not operate if that cannot be verified.

4. Account Management Functionality APIs

- 4.1 Subject to Section 4.2, the System shall make available a set of APIs and that mirror every functional requirement set forth in Appendix 3.8 for the System Website, the Customer Support Software, and the Administrator Interface.
- 4.2 The APIs provided pursuant to Section 4.1 shall provide an alternative method of transaction payment processing (in lieu of accepting Payment Cards and ACH payments) using an API Funds Pool (as set forth in Section 2.4.4.3) to be funded by the MBTA.
- 4.3 Regardless of whether the SI itself uses the APIs provided pursuant to Section 4.1 to connect the System Website, Customer Support Software, and Administrator Interfaces to other System Elements, the APIs shall provide all functionality that would have been needed to do so.
- 4.4 The APIs provided pursuant to Section 4.1 shall include the ability for the MBTA to directly submit Product orders (individually and for bulk and Group Accounts) for post-paid and revolving accounts.
- 4.5 **Availability and Eligibility**
The APIs provided pursuant to Section 4.1 shall only be made available to the MBTA and MBTA Persons. The specific technical method by which the SI will make this API available shall be subject to reasonable MBTA review and approval.

5. Location Data API

- 5.1 The System shall make available a location Data API to the MBTA to provide access on a real-time basis to the location Data identified in Appendix 4.5 that the System must make available on a time interval basis.
- 5.2 The System shall allow the MBTA to query and poll the location Data API intensively and continuously throughout the Operating Times for location Data for all System Elements included in the API (as defined in Section 5.1).
- 5.3 **Availability and Eligibility**
The location Data API shall only be made available to the MBTA and MBTA Persons. The specific technical method by which the SI will make this API available shall be subject to reasonable MBTA review and approval.

6. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.9. The narrative shall identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. [PSR: Proposer team experience: Application Programming Interfaces]

APPENDIX 3.10

EXTERNAL INTERFACES

The System shall make available External Interfaces which exchange Data between the System and other MBTA information systems and MBTA published interfaces.

The Proposal shall address the Technical Requirements set forth in this Appendix 3.10 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: External Interfaces general approach]

1. MBTA Published Interfaces

- 1.1 The System shall use the published interfaces available on the MBTA developer portal or any successor services offered by the MBTA (currently available at <http://realtime.mbtacom.com/>) as the source for the following Data for the System to use to fulfill the Technical Requirements:
 - 1.1.1 Scheduled Transportation Services;
 - 1.1.2 Real-time information on which Transportation Services are operating;
 - 1.1.3 Real-time and advance information about MBTA Service Failures and other cases in which Transportation Services may not operate as scheduled; and
 - 1.1.4 Position of Vehicles operating underground at and between Stations.
- 1.2 The SI's specific implementation of External Interfaces to these MBTA published interfaces shall be subject to Design Review as described in Appendix 7. [CDRL: External Interfaces implementation plan conceptual design] [CDRL: External Interfaces implementation plan preliminary design] [CDRL: External Interfaces implementation plan final design]
- 1.3 The SI shall comply with the MBTA's reasonable terms and conditions of use for the MBTA published interfaces available via the MBTA developer portal.
- 1.4 All implementation, operation, and maintenance of External Interfaces to these MBTA published interfaces shall be performed by the SI at the SI's expense and not subject to any compensation from the External Interfaces Reserve.
- 1.5 The SI shall adapt the System and its External Interfaces to changes in the MBTA published interfaces available via the MBTA developer portal throughout the Term at no cost the MBTA, provided the MBTA, via the MBTA developer portal, has provided reasonable advance information and notice about the changes, and the changes do not eliminate information required by the System to fulfill the Technical Requirements. Reasonable advance information in this case shall be considered at least ninety (90) days prior to the change.
- 1.6 All of the External Interfaces to the MBTA published interfaces shall be made available at least thirty (30) days prior to Pilot Phase 1.

2. Custom Interfaces to MBTA Information Systems

- 2.1 The SI shall implement, operate, and maintain External Interfaces to several MBTA information systems in order to get Data for use in the System and to populate MBTA information systems with

Data from the System, with such implementation subject to Design Review as described in Appendix 7; the several MBTA information systems include:

- 2.1.1 From MBTA Vehicle maintenance systems to the System to enable the System to determine which Vehicles are not available for Revenue Service for the purposes defined in Appendix 4.6;
 - 2.1.2 From the System to MBTA data warehouse systems for both near real-time transactional analysis throughout each day and aggregate trend and summary analysis, with the former available to MBTA data warehouses on a continuous replicated basis no more than 30 seconds after each unit of Data is in the System. All of the information identified in Appendix 3.1A other than Level 0 Data shall be included in the Data which is provided by the System for the MBTA's data warehouse;
 - 2.1.3 From the System to MBTA financial accounting systems to provide backup Data for all Fare Revenue and deposits defined in Appendix 4.2;
 - 2.1.4 To MBTA inspection violation tracking systems to record Inspection violations that occur using an Inspection Device, and from those same MBTA systems to update the System with the payment status, appeal status, and final disposition of violations, all to support the requirements of Appendix 2.7 and Appendix 4.5; and
 - 2.1.5 From MBTA reduced fare eligibility tracking databases to automatically update status and validity dates of Reduced Fare Group eligibility in Accounts for the purposes described in Appendix 3.8.
- 2.2 All of these External Interfaces to MBTA information systems shall be made available at least thirty (30) days prior to Pilot Phase 1, except for the inspection violation and reduced fare eligibility External Interfaces, which shall be made available at least thirty (30) days prior to the Revenue Service Commencement Date.
- 2.3 As part of the Implementation Work, the SI shall design, analyze, develop, and operate all External Interfaces to MBTA information systems, and in fulfilling such responsibilities shall be responsible for services including:
- 2.3.1 Meeting with the Personnel responsible for operating the other information systems, analyzing other information system versions, configuration, data schema, and actual data.
 - 2.3.2 Developing interface specification documents. [CDRL: Interface specification documents]
 - 2.3.3 Adapting System interface approaches and implementations to accommodate the MBTA information systems.
 - 2.3.4 Developing intermediate mapping and translations for data exchanged between systems.
 - 2.3.5 Proposing and executing interface test plans, communicating with Personnel responsible for other information systems about results, and iterating through design and implementation based on the results of the tests.
 - 2.3.6 Extension of the Communications Network to enable interconnection with the MBTA information systems.
- 2.4 The SI shall be compensated for the performance of the Implementation Work associated with these External Interfaces to MBTA information systems through the External Interfaces Reserve in accordance with Section 11.4 of the Project Agreement.
- 2.5 As part of the Operating Services, and not subject to any compensation from the External Interfaces Reserve, the SI shall also be responsible for:
- 2.5.1 Analysis, troubleshooting and communication with MBTA Personnel managing the MBTA information systems in Section 2.1 throughout the Term to ensure the External Interfaces continue to operate successfully to achieve the requirements of this Appendix 3.10.

- 2.5.2 Redesign, reconfiguration, and redevelopment of authentication, security, and connection protocols relating to the External Interfaces to ensure continued compliance of the System with Appendix 3.1.

3. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 3.10. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.5, 3.1, 3.1B, 3.7 and 3.8. [PSR: Proposer team experience: System capabilities and information security]

APPENDIX 4

OPERATION AND MAINTENANCE REQUIREMENTS

Table of Contents

Appendix 4.1 - Cash Handling

1. Collection.....1
2. Security2
3. Inspections, Audits, and Fraud Prevention2
4. Experience.....3

Appendix 4.2 - Flow of Funds

1. Deposits and Disputes.....1
2. Computation and Back-Up Information2
3. Reporting and Timing.....4
4. Experience.....10

Appendix 4.3 - Configuration and Change Management

1. Configuration1
2. Configuration, Staffing and Capability.....2
3. Included Change2
4. Change Management2
5. Special Exceptions3
6. System Software3
7. Experience.....3

Appendix 4.4 - Order Fulfillment and Account Servicing

1. Fare Card Production.....1
2. Order Fulfillment Standards.....1
3. Custom Fare Cards.....2
4. Distribution3
5. Conversion and Migration4
6. Customer Service and Charges5
7. MBTA Discretionary Refunds.....7
8. Experience.....7

Appendix 4.5 - Reporting, Data, and Reconciliation

1. Back-Up Data.....1
2. Negative Balance Accounts2
3. Cash Handling Reports2
4. Processing Costs3
5. Real-Time Dashboards.....3

- 6. Self-Assessment and Reconciliation Program3
- 7. Auditability4
- 8. Standard Reports and Query Capabilities4
- 9. Ongoing Ad-Hoc Data Analysis Services.....4
- 10. Location Data.....5
- 11. Asset Management.....7
- 12. Experience.....7

Appendix 4.6 - Maintenance and Self-Reporting

- 1. General.....1
- 2. Monitoring5
- 3. Notification and Tracking8
- 4. Preventative Maintenance.....8
- 5. Corrective Maintenance.....9
- 6. MBTA-Provided Facilities.....10
- 7. Access-Related Relief Events11
- 8. Retrieving Taps.....11
- 9. Inspection Device Servicing12
- 10. Recordkeeping and Reporting.....12
- 11. MBTA right to inspect.....14
- 12. Experience.....14

Appendix 4.7 - Merchant Services Provider Requirements

- 1. General Requirements.....1
- 2. Experience with Transaction Processing Volumes2
- 3. Payments and Transactions.....3
- 4. Merchant Identification Numbers3
- 5. Clearing and Settlement.....3
- 6. Account Updates.....4
- 7. Match Electronic and Embossed Primary Account Number4
- 8. EMV Transaction Cost-Effectiveness and Correctness4
- 9. ACH Payment Processing and Exceptions5
- 10. Dispute Resolution.....6
- 11. Experience.....7

APPENDIX 4.1

CASH HANDLING

The cash handled by Fare Vending Machines (FVMs) must be collected safely, securely and accurately in a manner consistent with MBTA policies relating to safety and security, and with Good Industry Practice. The SI must ensure that safe methods for cash collection are maintained. The SI is responsible for all aspects of cash collection, from accessing FVMs to the secure transfer of cash to a counting facility or bank.

The Proposal shall address the Technical Requirements set forth in this Appendix 4.1 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Cash handling plan]

1. Collection

1.1 Collection Procedures

- 1.1.1 Availability. Cash must be collected at regular intervals to maintain the standard for Device Availability as described in Appendix 8. The SI shall provide a detailed MBTA-specific collection schedule before any Pilots begin and keep that schedule updated throughout the Term. [CDRL: Cash collection schedule] [CDRL: Updated cash collection schedule]
 - 1.1.1.1 The SI's Proposal shall provide a sample collection schedule from a prior project in which the Proposer or the Proposer Team member managed the cash collection. [PSR: Cash handling plan]
- 1.1.2 Access. Collection of cash may not impact, disrupt or inconvenience Transportation Services or the Transportation Network
 - 1.1.2.1 Collection of cash may take place at any time a Station or Location is open and available to the SI without additional assistance from the MBTA.
 - 1.1.2.2 If used, vehicles must only be parked in designated loading zones or other locally designated permissible areas, and not impact, disrupt or inconvenience MBTA rail, transit or bus operations. Vehicles must not be parked on sidewalks or access paths to Stations or Stops, or disturb passenger and non-passenger flows around the Station or Stop. The SI is responsible for coordination with the appropriate authority (MBTA or municipal level) to arrange locations for vehicle parking.
 - 1.1.2.3 Collection operations within a Station or Stop must not impact, disrupt or inconvenience MBTA operations, including potential fouling of the right of way. Pedestrian flow in regular and emergency operations must not be affected by collection operations.
- 1.1.3 Cash shall be sorted and packaged appropriately for deposit.
- 1.1.4 Reconciling differences between SI records and those reported by the designated deposit target (see Appendix 4.2), including undetected counterfeits, shall be the responsibility of the SI.
- 1.1.5 Cash receipts shall balance throughout the cash handling and counting process described in this Appendix 4.1.

The SI's Proposal shall explain the cash collection procedures the SI will use to meet the requirements of this Section 1.1. [PSR: Cash handling plan]

1.2 Reporting

The SI shall provide reports on volume and processing levels, performance statistics, discrepancies, and inventory levels as described in Appendix 4.5. [CDRL: Cash handling reports]

2. Security

The SI must maintain secure operations, in line with Good Industry Practice, including:

2.1 Staffing and Facilities

2.1.1 The SI shall staff trained, qualified and licensed individuals for the collection, handling, and counting of cash. Identities of any such individuals shall be provided to the MBTA at least ten (10) days prior to the individual beginning work. [CDRL: Cash handling roster]

2.1.2 Any vehicles or materials needed shall be supplied and maintained by the SI.

2.1.3 The SI shall provide appropriate facilities and supplies to receive, sort, and count cash or assets in a secure manner, including video oversight, monitoring, and record-keeping equipment and services. A means of protecting cash or other assets, such as a vault, safe, or other secure space consistent with Good Industry Practice. The facility must have: an alarm system or other appropriate issue notification devices for promptly notifying the nearest responsible law enforcement officers of an attempted or perpetrated robbery, burglary, or larceny; closed circuit television (CCTV) system utilizing either analog and/or digital recording should be in use with a sixty (60) day retention period available for MBTA review upon request; and established and auditable procedures that control and monitor access/egress points.

2.1.3.1 The SI's Proposal shall provide a description of how its cash handling facility will meet these requirements. [PSR: Cash handling plan]

2.2 Protection

Prior to the use of any sort of protection (via armed personnel) for cash collecting staff in MBTA or other public facilities, the SI shall develop a plan to be approved by MBTA Transit Police. The use of protection or weaponry must at no times create a risk to the public.

The SI's Proposal shall include a description of protection planned for cash collection. [PSR: Cash handling plan]

2.3 Counterfeit Notes and Theft, Fraud or Loss

2.3.1 The SI shall use currency verification and counterfeit detection processes and equipment consistent with Good Industry Practice at all times.

2.3.2 Counterfeit notes shall be removed from deposits.

2.3.3 If any counterfeit notes are detected, the SI shall prepare and submit the appropriate Federal paperwork and reporting and provide written notice to MBTA within one (1) Business Day. [CDRL: Counterfeit note procedures]

3. Inspections, Audits, and Fraud Prevention

3.1 MBTA shall have the right to conduct an on-site audit of cash handling facilities at any time, with verbal notice of 24 hours or more.

3.1.1 These audits may only occur during Business Hours, and the MBTA agrees to perform any such audit in a manner that will not unreasonably or unduly disrupt SI's routine business operations at such facility.

- 3.1.2 Such audits shall be subject to SI's internal security procedures including without limitation verifying the identity of MBTA Personnel before allowing access to the facility, and providing an escort for MBTA Personnel at all times.
- 3.2 In the event additional research or investigation regarding any cash variance is requested by MBTA, responses shall be completed and findings sent to MBTA within three (3) Business Days of written request. The SI will be required to provide MBTA with records including:
- 3.2.1 Bank depository account records;
- 3.2.2 Daily collector cash report spreadsheet with the cash count identifying the Location; and
- 3.2.3 The bag or box number affected by the variance, the business date, the total cash received, and the cash variance computed between what was declared and the actual count.
[CDRL: Documentation of cash variance]
- 3.3 The SI shall report immediately to the MBTA any instances of theft, fraud or loss occurring within the collection process. The MBTA may at any time request additional information, response or Documentation to ensure the safety, security and accuracy of the SI's cash handling. [CDRL: Theft, fraud or loss report]

4. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 4.1. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 3.6, 4.2 and 4.7. [PSR: Proposer team experience: Revenue collection and remittance]

APPENDIX 4.2

FLOW OF FUNDS

The SI shall, following each Operating Day, apply (and reapply, as and to the extent required in this Appendix 4.2) the computations defined in this Appendix 4.2 to determine Fare Revenue. The SI shall deposit the Fare Revenue to the MBTA within the time limits defined in this Appendix 4.2 and as required by the Contract Standards. The SI will provide the MBTA with the Computation Report and Data to support the computations and as supplemented in Appendix 4.5, within the time limits defined in this Appendix 4.2 and as required by the Contract Standards.

The Proposal shall address the Technical Requirements set forth in this Appendix 4.2 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Flow of Funds general approach]

As part of the Technical Proposal evaluation, the SI shall perform a demonstration of the most similar processes to those described in this Appendix 4.2 used in an existing deployment delivered by the SI. [Technical Proposal Evaluation: Demonstration]

1. Deposits and Disputes

- 1.1 The SI shall deposit the Fare Revenue to the MBTA utilizing methods that comply with the standards set forth in Appendix 4.7 and this Appendix 4.2 and must ensure timely and reliable deposits of Fare Revenue.
 - 1.1.1 The SI's Proposal shall describe the details of the method for the deposit (e.g. using ACH or wire transfer) and explain how the proposed method will ensure timely and reliable depositing of Fare Revenue. [PSR: Method for deposit]
 - 1.1.2 The SI shall provide a Submittal to the MBTA detailing any future changes of deposit method, which shall be subject to MBTA approval. [CDRL: Method for deposit]
 - 1.1.3 The SI shall provide a Submittal to the MBTA not later than the Installation Commencement Date, which Submittal shall detail the method of applying Eligible Subtractions from Fare Revenue and shall be subject to MBTA approval. The Eligible Subtractions from Fare Revenue shall be determined in accordance with this Appendix 4.2 for each prior Month occurring during the Operating Period and shall not be applied until determined in respect of such prior Month pursuant to this Appendix 4.2. If the Eligible Subtractions from Fare Revenue for a particular Month would exceed the amount of Fare Revenue required to be deposited in respect of any Operating Day, such Eligible Subtractions from Fare Revenue shall be applied over multiple Operating Days so that the amount of Fare Revenue required to be deposited in respect of any Operating Day is never less than \$0 due to the application of Eligible Subtractions from Fare Revenue. [CDRL: Method for applying Eligible Subtractions from Fare Revenue]
- 1.2 The exact target(s) (e.g. bank account or similar) for deposit shall be Configurable by the MBTA. The MBTA may designate in writing a third party to receive the deposits (for example, a regional clearinghouse custodian); in which case the SI shall work with any third party so designated by the MBTA as its agent to Configure the System in respect of deposits.

- 1.3 In the event of a dispute or disagreement about Revenue Apportionment, the SI shall promptly upon request provide analysis services and provide Data sufficient to explain the disputed calculations, meet with the parties, and, if an actual discrepancy is found (where a discrepancy in this context is a miscalculation by the SI of anything in this Appendix 4.2 or Appendix 3.7), the SI will submit adjustment Documentation in writing, and the SI will have been considered not to have made the deposit accurately. Without limiting anything under Section 3.10 of this Appendix 4.2, any variance in the amount of Fare Revenue shall be included in a revised Computation Report and deposits adjusted as provided in Section 3 of this Appendix 4.2. [CDRL: Adjustment Documentation]

2. Computation and Back-Up Information

- 2.1 The SI shall compute Fare Revenue as described in this Appendix 4.2 at least daily. Separate computations shall be done for each Operating Day.
- 2.2 The correct computation of Fare Revenue for each Operating Day shall consist of the sum of computations A, B, and C, minus computation D as set forth in Section 2.3 below. The SI shall be entitled to apply Eligible Subtractions from Fare Revenue (if any) each Month commencing with the second Month of the Operating Period in accordance with the method approved by the MBTA pursuant to Section 1.1.3 of this Appendix 4.2. Eligible Subtractions from Fare Revenues shall only serve to offset Fare Revenue otherwise due to the MBTA pursuant to this Appendix 4.2 and shall not constitute a payment to the Systems Integrator or in any way obligate the MBTA to make any payment to the Systems Integrator.
- 2.3 The SI shall perform the following computations for each Operating Day to support determination of Fare Revenue (“Computation Reports”) without double-counting:
- 2.3.1 Computation A: Product Sales
- 2.3.1.1 Subject to Sections 2.3.1.2 and 2.3.1.3 of this Appendix 4.2, Computation A shall be the total monetary value of: (1) all (a) sales of any Product via all Sales Channels, (b) Enablement Fees paid by any User via all Sales Channels, and (c) purchases of Value for any API Funds Pool or APOS Funds Pool, for each of (a) through (c), when that sale or purchase has (i) occurred on the Operating Day being computed or (ii) was fulfilled by the SI or the System on the Operating Day being computed, whichever happened first, and (2) all payments made to any post-paid or revolving Account on the Operating Day being computed.
- 2.3.1.2 This computation shall not include orders that are neither paid nor fulfilled.
- 2.3.1.3 This computation shall not include Products issued using Value already in post-paid and revolving Accounts and API Funds Pools or APOS Funds Pools; only the purchases of Value applied to those Accounts and API Funds Pools shall be included in this computation.
- 2.3.2 Computation B: Open Payments Trips
- 2.3.2.1 For Trips which begin on the Operating Day being computed for which the System accepted a Tap from a Contactless EMV Credential at the beginning of the Trip, Computation B shall include the accurately computed monetary value of the Fares for all such Trips, irrespective of whether the System has requested or received any Authorization for the Fares, less the Fare for such Trips for which the acceptance of the Tap resulted from a Supervening Event.
- 2.3.3 Computation C: Recovery
- 2.3.3.1 For Trips which begin on the Operating Day being computed for which the System accepted a Tap from anything other than a Contactless EMV Credential at

- the beginning of the Trip but did so in a manner inconsistent with Fare Policy or Configuration, Computation C shall be the sum of the minimum possible monetary value of the Fare (specific to the applicable User, in accordance with Fare Policy and Configuration) for each such Trip from each User's point of origin, less the Fares for such Trips for which the acceptance of the Tap resulted from a Supervening Event.
- 2.3.4 Computation D: Direct Refunds Applied
- 2.3.4.1 Computation D shall include Direct Refunds applied on the Operating Day being computed, which are only such Direct Refunds resulting from MBTA Service Failures pursuant to Appendix 3.7 and MBTA Discretionary Refunds pursuant to Appendix 4.4.
- 2.4 The computed Fares used for purposes of computations B and C must precisely match the requirements of Appendix 3.7, and shall exclude the portion of the Fare for any Trip which is included in a Pass or other travel entitlement held by the User at the time of the Trip.
- 2.5 If a Trip is reported in computations B or C for an Operating Day but later is learned to have begun on the prior Operating Day (for Trips which span Operating Days, if allowed by Fare Policy), the Trip must remain in the Computation Report in which it was first reported.
- 2.6 Back-up information must be provided to the MBTA with each Computation Report in both spreadsheet and XML data formats and Documentation on the structure and definition of all fields and values shall be provided by the SI. Back-up information shall be at a level of detail that has at least one row for each Product sale, Enablement Fee, purchase of Value, Account, Trip, and Refund. The following back-up information must be provided for each computation.
- 2.6.1 Computation A: Identification of the Product, Enablement Fee, API Funds Pool or APOS Funds Pool, any entitlement associated with a Reduced Fare Group applied, the amount paid, the Sales Channel, the Transaction Channel, and a unique transaction identifier.
- 2.6.2 Computation B: Trip intraday ordering number, Fare calculation basis (indicating modes used and number of Trip segments), any entitlement associated with a Reduced Fare Group applied, the computed charge (accounting for and including mention of any Best Value Fare caps, Passes used, Penalty Fares applied, etc.), the minimum and maximum possible Fare from the origin, the reason why any Extension Fares or Penalty Fares or similar add-on Fares were applied, any automatic reductions to the Fare applied and the reason for each (for example, an MBTA Service Failure), the amount of the charge already authorized from a Payment Card and the remaining charge to authorize, the Transaction Channel, the Payment Card type and BIN number, identification of any specific Supervening Event relied upon to exclude a Trip, identification of the Trips excluded as allowed above, and a unique transaction identifier.
- 2.6.3 Computation C: Trip intraday ordering number, Fare calculation basis (indicating modes used and number of trip segments), any entitlement associated with a Reduced Fare Group applied, the computed charge (accounting for and including mention of any Best Value Fare caps, Passes used, Penalty Fares applied, etc.), the minimum and maximum possible Fare from the origin, the segment of the Trip for which any Extension Fares or Penalty Fares were applied, any automatic reductions applied and the reason for each (for example, an MBTA Service Failure), identification of any specific Supervening Event relied upon to exclude a Trip, identification of the Trips excluded as allowed above, and a unique transaction identifier.
- 2.6.4 Computation D: Reason for the Direct Refund using the categories defined in Section 2.3.4 of this Appendix 4.2, further detail on any automatic Direct Refund (specific MBTA

Service Failure, etc.), the payment method used to credit the Direct Refund (e.g. Payment Card, check, ACH), the Transaction Channel, the transaction identifier for any original User transaction, and a unique transaction identifier for the Direct Refund.

- 2.7 Whenever interest is due to the MBTA as provided in Section 3.5.2 below, that interest shall be separately accounted for in the Computation Reports and not combined with individual Trip and transaction amounts in the back-up information. [CDRL: Back-up information] [CDRL: Documentation for back-up information]

3. Reporting and Timing

- 3.1 The SI must produce all Computation Reports for each Operating Day, and must provide back-up information to each Computation Report as described in this Appendix 4.2. [CDRL: Computation Report]
- 3.2 Requirements regarding Fare Revenue Computation Reports and Fare Revenue deposits begin with commencement of Pilot Phase 1. Non-revenue versions of Computation Reports shall be made available in the Model Office starting on the date the MO Physical Space is made available to the MBTA. [CDRL: Non-revenue Computation Reports]
- 3.3 The Computation Report, including all required back-up information, shall be submitted to the MBTA no later than twenty-four (24) hours plus three (3) Business Days after the end of the Operating Day.
- 3.4 Fare Revenue shall be deposited in accordance with Section 1 of this Appendix 4.2 no later than twenty-four (24) hours plus four (4) Business Days after the end of the Operating Day.
- 3.5 The SI shall continue to monitor the System for any Data or Problem that could result in a change to the values of each Computation Report and to any individual charges making up each Computation Report.
- 3.5.1 If, for an Operating Day, the result of the computation defined in Section 2.2 of this Appendix 4.2 is greater than the amount deposited, the difference, along with interest in accordance with Section 3.5.2 of this Appendix 4.2, shall be deposited two (2) Business Days after the SI learns of the difference. The SI shall provide the MBTA with notice of the amounts of such payments along with a reconciliation of amounts paid and amounts due.
- 3.5.2 If the SI fails to meet the deadline for deposit of any Fare Revenue, as specified in Section 3.4 of this Appendix 4.2, the SI shall, without limiting its obligation to make such deposit, pay the MBTA interest at the Overdue Rate on the amount of such Fare Revenue, which interest shall be calculated in the manner specified in Section 10.6 of the Project Agreement.
- 3.5.3 If, for an Operating Day, the amount deposited is greater than the result of the computation defined in Section 2.2 of this Appendix 4.2, the difference shall be subtracted from the first deposit occurring two (2) Business Days after the SI learns of the difference. The SI shall provide the MBTA with notice of the amounts of such subtractions and a reconciliation of amounts paid and amounts due.
- 3.5.4 A revised Computation Report for each Operating Day with changes shall be submitted by the SI on the Business Day prior to a supplemental deposit or subtraction therefrom.
- 3.6 If the computation defined in Section 2.2 of this Appendix 4.2 results in a negative number for an entire Operating Day and a balance is therefore due to the SI, the SI shall include such amount as a specific line item on its Monthly Invoice. [CDRL: Negative balance invoice]

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- 3.7 On each day when the SI makes a deposit, the SI shall provide a deposit manifest report reconciling the amounts of the various deposits (and any subtractions therefrom) to the Computation Report(s) submitted on the prior Business Day. [CDRL: Deposit manifest report]
- 3.8 The Computation Report shall be subject to Design Review, as described in Appendix 7. The SI shall develop a prototype Computation Report and plans for submission of revised reports. The prototype Computation Report shall show a hypothetical Operating Day and shall use every term defined in this Appendix 4.2, every Sales Channel, every Transaction Channel, and every Fare Product mentioned in Appendix 3.7. The Computation Report Design Review shall be completed prior to the Installation Commencement Date. [CDRL: Prototype Computation Report and plans for submission of revisions]
- 3.9 Monthly Report of Eligible Subtractions from Fare Revenue
- 3.9.1 After the SI submits complete Computation Reports for each and every Operating Day for a Month, the SI may submit a Monthly report of Eligible Subtractions from Fare Revenue (an **“Eligible Subtractions Report”**) for that Month in accordance with this Section 3.9. Except as expressly required under Section 3.9.5.1 of this Appendix 4.2, the SI shall not be entitled to submit more than one Eligible Subtractions Report for a Month nor a partial or revised Eligible Subtractions Report for any Month. The submittal of an Eligible Subtractions Report by the SI in accordance with this Section 3.9 shall be a condition precedent to the SI’s entitlement to apply any Eligible Subtractions from Fare Revenues. In no event may Eligible Subtractions from Fare Revenues include any amount in respect of Chargeback or PAYG Loss that would not have been incurred had the SI complied with the Contract Standards. [CDRL: Eligible Subtractions Report]
- 3.9.2 Each Eligible Subtractions Report shall include:
- 3.9.2.1 A summary, with subtotals, of all itemized categories and amounts described in this Section 3.9.2 and all amounts described in Sections 3.9.3 and 3.9.4 of this Appendix 4.2;
- 3.9.2.2 Itemization of any Chargeback or PAYG Loss incurred for which:
- 3.9.2.2.1 The SI has not recovered or collected the monetary amounts of the Chargeback or PAYG Loss in full;
- 3.9.2.2.2 The Chargeback or PAYG Loss stemmed from a Payment Card transaction in the System in respect of which the SI and the System complied with all Contract Standards;
- 3.9.2.2.3 The full monetary amount of the Chargeback or PAYG Loss has neither been included in Eligible Subtractions from Fare Revenue nor subtracted from Fare Revenue; and
- 3.9.2.2.4 The SI has, in the Month, exhausted all reasonable initial opportunities to dispute or collect the monetary amount of the Chargeback or PAYG Loss in accordance with the Contract Standards, as and to the extent that the Contract Standards require that the SI do so; provided that, without limiting any obligation of the SI hereunder, at least five (5) Business Days shall have elapsed from the occurrence of a declined Authorization or a Chargeback before the SI may itemize the applicable Chargeback or PAYG Loss in an Eligible Subtractions Report;

- 3.9.2.3 Itemization of any previously disputed Chargeback or PAYG Loss which is no longer the subject of a dispute by either Party and for which each of the criteria in Section 3.9.2.2 of this Appendix 4.2 are met;
 - 3.9.2.4 Itemization of all Basic Interchange incurred by the SI which stemmed from Payment Card transactions in the System in respect of which the SI and the System complied with all Contract Standards; and
 - 3.9.2.5 A certification by the Systems Integrator Representative that, to the best of the knowledge of the Systems Integrator (after due inquiry), all information included in the Eligible Subtractions Report is accurate and complies with all requirements of this Section 3.9.
- 3.9.3 Chargeback and PAYG Loss Baseline:
If the subtotal amount of any component of the Chargebacks or PAYG Losses included in any Eligible Subtractions Report exceeds a corresponding amount established in respect of a defined component in the Chargeback and PAYG Loss Baseline in effect at the time of the submittal of the applicable Eligible Subtractions Report:
- 3.9.3.1 The SI shall develop and implement a method for identifying the Excess Chargebacks and PAYG Losses from the full set of Chargebacks and PAYG Losses for the Month; the method shall prioritize the largest net Chargebacks and PAYG Losses in the Month for inclusion in the Excess Chargebacks and PAYG Losses, and shall be subject to Design Review, as described in Appendix 7. Such Design Review shall be completed prior to the Installation Commencement Date. [CDRL: Method for identifying Excess Chargebacks and PAYG Losses] [CDRL: Method for identifying Excess Chargebacks and PAYG Losses conceptual design] [CDRL: Method for identifying Excess Chargebacks and PAYG Losses preliminary design] [CDRL: Method for identifying Excess Chargebacks and PAYG Losses final design]
 - 3.9.3.2 The Eligible Subtractions Report shall identify and categorize each Chargeback or PAYG Loss (and portion thereof, if applicable) in the Excess Chargeback and PAYG Losses in accordance with the method established pursuant to Section 3.9.3.1 and into one of the following categories:
 - 3.9.3.2.1 A Chargeback or PAYG Loss which resulted from fraud, from MBTA Service Failure, or from MBTA's rejection of risk and fraud management techniques and configuration proposed or implemented by the SI, as and to the extent that such techniques and configuration have prevented similar losses when implemented in an automated, account-based open fare collections system in North America serving purposes similar to the System (i.e., the amount that qualifies for inclusion in the Eligible Subtractions from Fare Revenues); or
 - 3.9.3.2.2 Any other Chargeback or PAYG Loss (i.e., the amount that does not qualify for inclusion in the Eligible Subtractions from Fare Revenues).
- 3.9.4 Required calculations, substantiations, and back-up information in the Eligible Subtractions Report:
- 3.9.4.1 For each Chargeback or PAYG Loss itemized in an Eligible Subtractions Report in accordance with Section 3.9.2.2 or Section 3.9.2.3 of this Appendix 4.2, the Eligible Subtractions Report shall include:
 - 3.9.4.1.1 Subject to Section 3.9.4.1.6 of this Appendix 4.2, the amount of the Chargeback or PAYG Loss incurred, net of any recovery, collection, or return which occurred in the Month, net of any Direct Refund

- issued in respect of the transaction on which the Chargeback or PAYG Loss is based, and net of any portion already included in Eligible Subtractions from Fare Revenue or subtracted from Fare Revenue; without limiting anything under Sections 3.9.3.2, 3.9.5.2.1, and 3.10 of this Appendix 4.2, the foregoing amount shall be the portion of any Chargeback or PAYG Loss which may be eligible for inclusion in the Eligible Subtractions for Fare Revenue;
- 3.9.4.1.2 The date when the Chargeback or PAYG Loss was first incurred;
 - 3.9.4.1.3 A unique transaction identifier matching the back-up information previously provided in accordance with Section 2.6 of this Appendix 4.2;
 - 3.9.4.1.4 A summary of all attempts made to dispute, collect, or recover the amounts, including nature and dates of such attempts; it being understood that the MBTA shall be entitled to all back-up information evidencing such attempts in the event of a dispute by the MBTA;
 - 3.9.4.1.5 A unique identifier for the Chargeback or PAYG Loss;
 - 3.9.4.1.6 If the Chargeback or PAYG Loss was subject to a dispute by the MBTA in accordance with Section 3.9.5.2.1 of this Appendix 4.2 (excluding any dispute initiated by the SI) and was not added to the Eligible Subtractions from Fare Revenue, and that dispute has been finally resolved in favor of the SI, indication to that effect and the dates of the dispute initiation and resolution. In the event described in the previous sentence, simple interest shall be added to the amount in Section 3.9.4.1.1 of this Appendix 4.2 at the Overdue Rate and shall be calculated on the basis of a 365-day year from the date such Chargeback or PAYG Loss would have been applied as part of Eligible Subtractions from Fare Revenues in accordance with the Contract Standards but for the dispute by the MBTA; and
- 3.9.4.2 For each Chargeback or PAYG Loss which was included in any Eligible Subtractions Report submitted for a prior Month and which stemmed from a Payment Card transaction in the System in respect of which the Contract Standards require that the SI continue to make attempts to dispute, collect, or recover amounts:
- 3.9.4.2.1 The unique identifier for the Chargeback or PAYG Loss previously reported in accordance with Section 3.9.4.1.5 of this Appendix 4.2;
 - 3.9.4.2.2 A summary of all attempts made to dispute, collect, or recover the amounts, including nature and dates of such attempts; it being understood that the MBTA shall be entitled to all back-up information evidencing such attempts in the event of a dispute by the MBTA; and
 - 3.9.4.2.3 The amounts recovered or collected, if any. This amount shall be treated as a negative number for purposes of the Eligible Subtractions Report, including in the summary required in Section 3.9.2.1 of this Appendix 4.2.
- 3.9.4.3 For each Chargeback or PAYG Loss (and portion thereof, if applicable) in the Excess Chargeback and PAYG Losses (if any), the Eligible Subtractions Report shall include auditable, verifiable back-up information that documents each categorization of applicable Chargeback or PAYG Loss.

- 3.9.4.4 For each Payment Card transaction for which any Basic Interchange is included in an Eligible Subtractions Report in accordance with Section 3.9.2.4 of this Appendix 4.2:
 - 3.9.4.4.1 The amount of Basic Interchange attributable to the transaction, broken down into the categories allowed in the definition of Basic Interchange and separately listing percentage and fixed amounts; and
 - 3.9.4.4.2 A unique transaction identifier matching the back-up information previously provided in accordance with Section 2.6 of this Appendix 4.2.
- 3.9.4.5 A description and figures showing how any components of Basic Interchange imposed other than at the transaction level (including monthly assessments from a Payment Card Organization, as and to the extent such is included in Basic Interchange) have been allocated among transactions, which allocation shall serve to allocate those costs to the transactions which drive the costs, to a level of detail sufficient to demonstrate the SI's compliance with the Payment Processing Requirements.
- 3.9.5 MBTA review:

The MBTA shall review each Eligible Subtractions Report submitted by the SI in accordance with this Section.

 - 3.9.5.1 The MBTA shall use all reasonable efforts to complete its review within ten (10) Business Days of receipt of a complete Eligible Subtractions Report. If the MBTA finds that the Eligible Subtractions Report is not complete, the MBTA shall request the information from the SI, and the SI shall provide a revised complete Eligible Subtractions Report.
 - 3.9.5.2 If the MBTA disputes any part of an Eligible Subtractions Report, the MBTA shall provide written notification to the SI and either Party may initiate the Dispute Resolution Procedures.
 - 3.9.5.2.1 Without limiting anything under Sections 3.10 or 3.9.4.1.6 of this Appendix 4.2, within fifteen (15) Business Days of receipt of a complete Eligible Subtractions Report, the MBTA shall notify the SI in writing of the net amount of undisputed Chargeback or PAYG Losses and undisputed Basic Interchange and such amount, if any, shall be the Eligible Subtractions from Fare Revenue for the Month. If any amount identified in Section 3.9.4.2.3 of this Appendix 4.2 exceeds the amount of otherwise applicable Eligible Subtractions from Fare Revenues, such amount shall be due as Fare Revenue for the Operating Day on which the MBTA provides notice to the SI pursuant to this Section 3.9.5.2.
- 3.9.6 Independent Payment Consultant Review:

The Independent Payment Consultant may serve as a Mediator of any dispute in respect of an Eligible Subtractions Report. In addition, in the event of a dispute concerning any Excess Chargeback and PAYG Losses categorized pursuant to Section 3.9.3.2 of this Appendix 4.2, the MBTA shall have the right, at its cost and expense subject to reimbursement from the SI pursuant to Section 3.9.6.7, to require that the Independent Payment Consultant review the SI's categorizations of the Excess Chargebacks and PAYG Losses in the applicable Eligible Subtractions Report. In such event:

 - 3.9.6.1 The Independent Payment Consultant shall have the right to review the Eligible Subtractions Report, including all back-up information, and to query using the

- audit tools and capabilities of the System and of the Acquirer and any other PSP involved in processing Payment Card transactions for the System;
- 3.9.6.2 The Parties shall use all reasonable efforts to cause the Independent Payment Consultant to provide a written report of its findings within fifteen (15) Business Days of the MBTA's notice of dispute, which report shall either verify the SI's categorizations of Excess Chargeback and PAYG Losses or re-categorize the Excess Chargeback and PAYG Losses;
 - 3.9.6.3 Within five (5) Business Days of receiving such written report, both the MBTA and the SI shall respond to the other and to the Independent Payment Consultant in writing, signifying either acceptance or rejection of the findings of such written report;
 - 3.9.6.4 The failure of either Party to respond within such five (5)-Business Day period shall be deemed an acceptance of the findings of the written report by that Party;
 - 3.9.6.5 The findings of the Independent Payment Consultant shall be final and binding only to the extent the Parties accept such findings, either expressly or to the extent deemed accepted by virtue of that Party's failure to respond within such five (5)-Business Day period;
 - 3.9.6.6 Any rejection of such findings shall be subject to the Dispute Resolution Procedures; and
 - 3.9.6.7 The SI shall reimburse the MBTA for the cost of the Independent Payment Consultant in connection with such review if the dispute is resolved such that the amount categorized pursuant to Section 3.9.3.2.2 in the Eligible Subtractions Report is increased by more than one percent (1%).
- 3.10 Inspection, Remediation, and Audit
- 3.10.1 Without limiting the MBTA's rights under Section 5.6(B) of this Project Agreement, the MBTA shall have the right at any time to inspect all records, submittals, and Data, including the Computation Reports, the calculation methods used within the Computation Reports, the back-up information, any Eligible Subtractions Report, all other Data and information submitted by the SI in respect of Fare Revenue, the records and systems of the Acquirer as provided in Appendix 4.7, all reporting, query, audit, and similar capabilities and services of the SI and the System required by the Contract Standards, and all information required to be kept under Section 5.6(A) of this Project Agreement.
 - 3.10.2 If an MBTA inspection pursuant to Section 3.10.1 of this Appendix 4.2 reveals that the SI has understated Fare Revenue, including by incorrectly applying any calculation, computation, condition, or method set forth in this Appendix 4.2, or as a result of missing or omitted Data that the SI had (or should have had, in accordance with its obligations under this Project Agreement), or as a result of failure to comply with any other requirement of this Appendix 4.2 such that the resulting Fare Revenue is less than it would have been had the SI correctly applied such calculation, computation, condition, or method, included all missing or omitted Data, and fully complied with the requirements of this Appendix 4.2:
 - 3.10.2.1 The MBTA shall notify the SI of the results of the inspection, including indication of Operating Day(s) and amounts with discrepancies;
 - 3.10.2.2 Subject to Section 13.1(C) of the Project Agreement in respect of a Compensation Event described under Item (19) of the definition thereof, Fare Revenues based on correct application of all calculations, computations, and methods and inclusion of all missing or omitted Data shall be due in accordance with Section 3.4 of this Appendix 4.2 for the Operating Day on which MBTA delivers notice pursuant to Section 3.10.2.1; provided that, in the event (a) of gross negligence or

- willful misconduct by any Systems Integrator Person in the miscalculation of Fare Revenue or (b) the amount of the understated Fare Revenue exceeds one percent (1%) of the total Fare Revenue that should have been deposited, the MBTA shall have the right, in its discretion, to specify that such Fare Revenue shall be due retroactive to each Operating Day indicated in the MBTA's inspection;
- 3.10.2.3 Subject to Section 3.10.2.2 of this Appendix 4.2, the SI shall revise and resubmit the Computation Reports for each Operating Day indicated in the MBTA's inspection, in accordance with Section 3.5 of this Appendix 4.2;
- 3.10.2.4 The SI shall prepare and provide a root cause analysis and Remediation Plan in response to the MBTA's inspection within ten (10) Business Days, and shall implement that Remediation Plan within twenty (20) Business Days thereafter; and
- 3.10.2.5 If a second or any subsequent inspection pursuant to Section 3.10.1 of this Appendix 4.2 finds discrepancies after the expiration of the time allowed in Section 3.10.2.4 for implementation of the Remediation Plan, or if the SI does not comply with the requirements of Section 3.10.2.4 of this Appendix 4.2:
- 3.10.2.5.1 The MBTA may, at its discretion, commission an independent audit of the information identified in Section 3.10.1 of this Appendix 4.2 and the information required to be kept under Section 5.6(A) of this Project Agreement for any Operating Days, whether or not included as part of MBTA's inspection;
- 3.10.2.5.2 The MBTA shall have discretion as to the selection of the auditor and the scope of the audit, subject to the limitations set forth in this Section 3.10 and in Section 5.6 of this Project Agreement; and
- 3.10.2.5.3 The SI shall reimburse the MBTA for any and all fees and costs incurred in connection with the inspection and audit.
- 3.10.3 Any determination made by the MBTA pursuant to this Section 3.10 shall be subject to the Dispute Resolution Procedures.

4. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 4.2. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 3.6, 4.1 and 4.7. [PSR: Proposer team experience: Revenue collection and remittance]

APPENDIX 4.3

CONFIGURATION AND CHANGE MANAGEMENT

1. Configuration

Wherever the Project Agreement refers to: (a) any System Element being “Configurable,” “Configured,” “flexible,” or (b) the MBTA being able to “Configure,” “specify,” “define,” “change,” “modify,” “establish” or “set” any aspect of the System’s operation or the SI’s operation, maintenance and other services, the Configuration rights and requirements in this Appendix 4.3 apply.

- 1.1 The SI shall accept, interpret, analyze, document, test, apply, deploy, validate, and track all Configuration, including whatever work in whatever System Elements is required. The MBTA shall not be asked nor required to perform any of these functions; for example, the MBTA will not use SI Configuration software to maintain Product prices. The SI is responsible for seeking out and keeping a full understanding of the meaning of and interdependencies among all Configuration elements, and to take these into consideration in fulfilling these Configuration responsibilities.
- 1.2 As part of Implementation Work, the SI shall also gather all needed baseline Configuration for the System from the MBTA and all other sources.
- 1.3 The SI shall gather and accept Configuration information from the MBTA in existing information formats. The MBTA shall not be required to alter the formats of any existing document or source data.
- 1.4 The SI shall ensure that all Configuration is put into effect in timeframes consistent with (a) the deadlines and timeframes established by Fare Policy and service delivery policy, (b) public announcements of any MBTA Entity, and (c) any other timelines and deadlines communicated by the MBTA with reasonable notice. In no case shall the timeframes for putting Configuration into effect exceed the following:
 - 1.4.1 Thirty (30) Business Days for Fare Policy changes involving more than two (2) Products (in the manner defined and counted by Fare Policy) or changing business rules;
 - 1.4.2 One (1) business day for Fare Policy changes only altering the price of up to two (2) Products (in the manner defined and counted by Fare Policy);
 - 1.4.3 One (1) calendar year for the Enablement Fee;
 - 1.4.4 Ten (10) Business Days for audio volume on any Customer-Facing Device;
 - 1.4.5 Eight (8) Business Hours for the operating mode of the Model Office;
 - 1.4.6 Ten (10) minutes for the availability or unavailability of the System Website, APIs, and any other Internet-based Customer-facing element of the System;
 - 1.4.7 Two (2) Business Days for bank identification number (BIN) range (as used in Good Industry Practice) blocking and changes to the calibration/limits of existing Velocity check constraints;
 - 1.4.8 Five (5) Business Days for all API parameters and Configuration except the addition of a new Integrated Service;
 - 1.4.9 Thirty (30) Business Days for the addition of a new API Integrated Service;
 - 1.4.10 Thirty (30) minutes for application of Automatic Refunds stemming from MBTA Service Failures and problems;
 - 1.4.11 Five (5) Business Days for the target of deposits of Fare Revenue;
 - 1.4.12 Six (6) months to change any audible tone made by a Gate;

- 1.4.13 Three (3) months to implement new Fare Card artwork if the SI is also permitted to continue distributing prior versions until stock is exhausted;
 - 1.4.14 Six (6) months to implement new Fare Card artwork if the SI is not permitted to continue distributing prior versions of artwork;
 - 1.4.15 Ten (10) Business Days for the setup of a new APOS;
 - 1.4.16 Five (5) Business Days for implementation in respect of risk management, Velocity limits, and fraud management; and
 - 1.4.17 Thirty (30) Business Days for anything else not specified otherwise herein.
- 1.5 The SI shall propose timeframes for putting Configuration into effect that are equal or better than those set forth in Section 1.4, specifically identifying any improvement over the timeframes set forth in Section 1.4. [PSR: Configuration timeframes]

2. Configuration, Staffing and Capability

The SI's proposed system and process for Configuration must describe in detail how the SI will ensure that the entirety of the System and the SI's team is capable of fulfilling the Configuration responsibilities in a timely and efficient manner. [PSR: Mechanism and process to notify MBTA of Configurations]

3. Included Change

Whenever this Project Agreement expressly requires the SI or the System to: (a) comply with any updated versions of policies, procedures, standards, laws, regulations, or other requirements that may affect or require change to the System, or (b) update, Update, Upgrade, replace, redesign, or maintain any System Element, all requisite expense and work associated with Configuration necessary to fulfill those obligations and responsibilities shall, except as expressly provided hereunder in respect of Change in Payment Industry Standards, belong to the SI and not the MBTA.

4. Change Management

The SI shall propose and implement a Change Management Plan (CMP) to ensure the successful and timely implementation of all Configuration, including all Configuration required in respect of any Change. [CDRL: Change Management Plan]

- 4.1 The Change Management Plan shall be subject to Design Review as described in Appendix 7. The SI's Proposal shall include a conceptual version of a Change Management Plan. [PSR: Change Management Plan conceptual version] [CDRL: Change Management Plan preliminary version] [CDRL: Change Management Plan final version]
- 4.2 The SI shall continue to update that Change Management Plan throughout the Term as requested by the MBTA. [CDRL: Updated Change Management Plan]
- 4.3 During the Preliminary Design Review of the CMP, the SI shall propose a mechanism and process by which the MBTA shall give Configuration notifications, and that will permit the MBTA to view and track progress of all Configuration requests, including MBTA generated changes to ongoing Configurations. Notification forms and system format for MBTA tracking shall be proposed. [CDRL: Configuration notification and tracking]
- 4.4 The CMP must be consistent with the Information Technology Infrastructure Library Service Transition v3 (2011) standards.

- 4.5 The CMP must include re-execution of relevant testing and re-demonstration of functionality and equipment in the Model Office.
- 4.6 The CMP shall include a description of regression testing that the SI will use to verify that System Elements previously tested still perform correctly even after they have been changed or interfaced with other System Elements.
- 4.7 The CMP shall include specific procedures for each type of Configuration, detailing the SI's workflow for intake, analysis, confirmation, testing, and application of all Configuration with forms, workflows and testing procedures.

5. Special Exceptions

- 5.1 Except as noted here or elsewhere in the Project Agreement, there are no restrictions on the scope, number or frequency of the MBTA's right to request and the SI's obligation to perform Configuration; provided that:
 - 5.1.1 It shall be an MBTA Change if the SI is required to implement more than two (2) Configurations of the Enablement Fee during the Initial Term;
 - 5.1.2 It shall be an MBTA Change if the SI is required to implement more than one (1) Configuration of the Enablement Fee during any Renewal Term;
 - 5.1.3 Configuration in respect of a Change in Payment Industry Standards shall be subject to Section 13.8 of the Project Agreement; and
 - 5.1.4 It shall be an MBTA Change if the SI is required to implement more Configuration to Pay API properties than one hundred fifty (150) properties in total; this limit would cover, for example, setting up three (3) Integrated Services each offering up to five (5) service types, with each service type having ten (10) Configured properties.
- 5.2 The MBTA will not define or restrict commissions and fees that the SI pays to Retail Reload Locations and such commissions and fees are not included within the scope of the SI's Configuration responsibilities hereunder.

6. System Software

- 6.1 The Proposal shall include a comprehensive list of all System Software, including:
 - 6.1.1 A list of all System Software that the Proposer, if selected as the Systems Integrator, will provide;
 - 6.1.2 A disclosure as to whether each piece of System Software constitutes (a) COTS Software, (b) Open Source Software, or (c) Systems Integrator proprietary Software;
 - 6.1.3 Copies of each license for all COTS Software and Open Source Software; and
 - 6.1.4 A designation of what System Software constitutes Third Party Software.
[PSR: System Software list]
- 6.2 In the event that the Systems Integrator seeks to change any System Elements pursuant to Article 16 (Intellectual Property Rights) Section 16.3(C) (Changes to System Elements), the Systems Integrator shall first submit to the MBTA for review (which MBTA shall undertake acting reasonably) an updated System Software list reflecting the proposed System Element change prior

to implementing such a change, noting comparisons against the material in Appendix 6. [CDRL: System Software list]

7. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 4.3. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.11, 4.5 and 4.6. [PSR: Proposer team experience: Management, maintenance and reporting]

APPENDIX 4.4

ORDER FULFILLMENT AND ACCOUNT SERVICING

The SI shall fulfill and service all orders and requests for Products and Media in a timely and efficient manner and provide Account servicing as defined in this Appendix 4.4. The SI shall provide effective, courteous and efficient customer service to any User with whom the SI is required to interact. The MBTA may designate other MBTA Persons to administer Group Account relationships, however, the SI shall remain responsible for all requirements of this Appendix 4.4, including customer service to the MBTA and such designated MBTA Persons.

The Proposal shall address the Technical Requirements set forth in this Appendix 4.4 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Approach to Order Fulfillment and Account Servicing]

1. Fare Card Production

- 1.1 The SI is responsible for the manufacturing, personalizing, encoding, and testing of all Fare Cards (including all necessary Subcontracts, machinery, licenses and certifications) and associated packaging. Fare Card artwork shall be Configurable.
 - 1.1.1 Packaging specifications for retail and non-retail Fare Cards shall be developed and managed by the SI consistent with the Contract Standards and the needs of the Retail Reload Locations.
- 1.2 The SI shall warehouse Fare Cards after production, with an adequate supply on hand to fulfill all orders, stock all Fare Vending Machines and Retail Reload Locations, and protect against any disruption to the supply chain. The SI shall either keep a supply sufficient for at least six (6) months on hand or propose and implement a different approach.
 - 1.2.1 If the SI proposes an alternate approach for Fare Card supply, the Proposal shall explain how that approach will ensure adequate supply on hand and immediately available as needed. [PSR: Approach to Order Fulfillment and Account Servicing]
 - 1.2.2 The SI shall ensure that the on-hand supply of Fare Cards supports distribution for all artwork styles including special versions for Reduced Fare Groups and Enhanced Fare Cards.
- 1.3 Fare Card serial numbers shall be tracked through a distribution and inventory management subsystem, which shall be sufficient to report on used and unused Media, by production batch, manufacturing date, distribution date, distribution channel, product type, and distribution Location; if there is any conflict between this requirement and the requirements set forth in Appendix 3.1A, the latter takes precedence and the former shall be fulfilled to the greatest extent possible. [CDRL: Distribution and inventory management subsystem]

2. Order Fulfillment Standards

- 2.1 An order is considered fulfilled for purposes of Section 2 of this Appendix 4.4 when:

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- 2.1.1 All Fare Card(s) ordered have been placed in the mail or shipped to the User by the SI, or the order has been delivered to the MBTA (or the MBTA-designated MBTA Person) for orders in which the MBTA has specifically requested in writing such delivery;
 - 2.1.2 The shipped or delivered orders actually include the ordered Fare Card(s) in a usable state; and
 - 2.1.3 All Value and Products ordered which do not require mailing or shipment of Fare Cards have been applied to the applicable Accounts.
- 2.2 The acceptable Fare Card defect rate shall be less than 0.01% of fulfilled orders. For the purposes of this Section 2.2, defects shall include manufacturing defects affecting the Fare Card's usability, printing defects, and shipping/order fulfillment errors.
- 2.2.1 The SI shall develop and implement a sampling plan to demonstrate compliance with the requirement of this Section 2.2 and provide the results of that plan to the MBTA monthly. [CDRL: Defect rate sampling plan] [CDRL: Defect rate sampling monthly results]
- 2.3 The SI shall fulfill orders and Fare Card requests within two Business Days (starting immediately if during normal Business Hours, or the next Business Day if not during normal Business Hours) of the later of order placement and payment.
- 2.4 All Value and Products ordered which do not require mailing or shipment shall be fulfilled within fifteen (15) seconds for 95% of orders, and sixty (60) seconds for 99.8% of orders.

3. Custom Fare Cards

- 3.1 The SI shall make available a sales option for third parties to order limited customizations of Media that otherwise meets all Contract Standards (including all security and privacy requirements). The SI shall fully implement the availability of this white-label and third party media in the same manner as the Fare Card.
- 3.1.1 The SI shall use commercially reasonable efforts to negotiate with all potential customers of Custom Fare Cards.
 - 3.1.2 The SI shall always treat potential customers with courtesy, good faith, and professionalism.
 - 3.1.3 The SI shall clearly communicate procedures for order intake, negotiation, pricing in general, and delivery (including turnaround times).
 - 3.1.4 The SI shall seek and receive MBTA approval of all artwork and other design elements of each such Media.
 - 3.1.5 To the extent compatible with Good Industry Practice and not in conflict with the Contract Standards, the SI shall include in its offerings for Custom Fare Cards the ability to incorporate other access control technologies (other smartcard chips, optical, magnetic stripe, etc.), but in no event shall these other technologies be accepted by the System.
 - 3.1.6 The SI shall provide reports to the MBTA of all Custom Fare Card orders as described in Appendix 4.5.
 - 3.1.7 All Custom Fare Cards shall satisfy all Contract Standards pertaining to Fare Cards except in the specific customizations negotiated with the third party, none of which are permitted to reduce the Contract Standards with respect to information security and privacy. The requirements of Appendices 2.6 and 3.1 relating to Incidents involving Fare Cards apply identically to Incidents involving Custom Fare Cards (except with respect to replacement costs for the Custom Fare Card Media, which shall be negotiated between the SI and the third party).

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- 3.1.8 All requirements of Appendix 3.8 regarding bulk Media management and association with Groups also apply to Custom Fare Cards; the SI may provide additional services to Custom Fare Cards customers to facilitate automatic creation of Accounts and automatic linking of Custom Fare Cards to Accounts. The SI shall seek and receive MBTA approval for such arrangements.
 - 3.1.9 The SI shall provide customer service to Custom Fare Card customers in the event of Problems with the Media, and shall not enter into an agreement with a third party to sell media that does not satisfy the quality standards of Appendix 2.6. The SI shall implement a customer service program defining how it will staff, operate and ensure courteous, professional, timely and effective customer service.
 - 3.1.10 In the event that Custom Fare Cards are causing Problems with System operation (including, for example, if the Custom Fare Card is intermittently rejected at Readers at a higher rate than the Standard Fare Card), the SI shall address that issue as part of both its customer service obligations to the third party and as part of the required maintenance of the System.
 - 3.1.11 The SI shall ensure that the MBTA receives the full required Enablement Fee before any Custom Fare Card is Enabled for use in the System.
- 3.2 Enablements of Custom Fare Cards shall be excluded from calculation of Availability Payments related to Fare Cards; amounts collected by the SI from the third party customer of the Custom Fare Cards represent the SI's entire compensation for delivery of such Custom Fare Cards.
 - 3.3 For purpose of this Section 3.3, the MBTA shall also be considered a third party eligible to purchase Custom Fare Cards from the SI as an MBTA Change.
 - 3.4 The Proposal shall explain the SI's management and technical approach to fulfilling the Custom Fare Card requirements, and shall identify all other known access control technologies that can and cannot be integrated into the Fare Card for this purpose. [PSR: Approach to Order Fulfillment and Account Servicing]

4. Distribution

- 4.1 Division of Responsibilities
 - 4.1.1 The SI shall be responsible for the order fulfillment (including but not limited to shipping and delivery) of all Fare Card orders placed through the System Website, IVR, Administrator Interface, third party Users, and in support of the Retail Reload Locations.
 - 4.1.2 The SI shall ship Fare Cards to Groups.
 - 4.1.3 In general, the SI shall only fulfill Fare Card orders when the applicable Enablement Fee has been paid, or has been waived by the MBTA. However, the SI shall offer a service to Groups to place bulk orders of Fare Cards which are not Enabled, and may charge the Customer for those orders up to the same amount that the SI would otherwise charge the MBTA for the Enablement of the Fare Card (if that amount is less than the MBTA's applicable Enablement Fee)
 - 4.1.4 The SI shall not be responsible for taking front-line customer service phone, e-mail, and mail inquiries from Customers nor accepting Product orders from Customers by phone (including Group Account Administrators), except in respect of the IVR and as defined in Section 5 of this Appendix 4.4.

4.2 Distribution to the MBTA

- 4.2.1 The System shall include an ability for the MBTA or MBTA Persons to order Fare Cards for further distribution.
 - 4.2.1.1 Such delivered cards shall be free of retail packaging, and the System shall deliver these Fare Cards Configured as requested by the MBTA
 - 4.2.1.2 The MBTA shall be able to specify whether Enablement Fees will be waived for each order or ultimately applied to Account.
 - 4.2.1.3 The System shall ensure that final activation of the Fare Cards is deferred until MBTA (or its third party contractor(s)) acknowledges receipt of the order. The System shall prevent Fare Cards ordered by the MBTA from being used for travel or payment until the MBTA or MBTA Persons have acknowledged receipt and thereafter must be activated within two business days (starting immediately if during normal business hours, or the next business day if not during normal business hours).
- 4.2.2 The System shall provide functionality for the MBTA (or its third party contractor) to associate Fare Cards with various group or bulk Accounts, or with individual Accounts for employees, contractors, interns, public safety officials and others. This functionality shall be supported using ranges of card numbers to allow multiple Fare Cards (with a limit no less than 50,000 and the actual limit proposed by the SI) to be assigned and activated in a batch.
 - 4.2.2.1 The SI's Proposal shall describe limits for the number of Fare Cards associated with a Group Account or bulk order. [PSR: Approach to Order Fulfillment and Account Servicing]
- 4.2.3 The SI shall provide a process for the MBTA to order and receive Fare Cards to allow for immediate fulfillment without the ordering and delivery process, which SI shall ensure then can be used by the MBTA, individually or in bulk (using the same process and limit as in the prior requirement) to:
 - 4.2.3.1 Waive card enablement fees (and use that indication on all accounting reports);
 - 4.2.3.2 Sell Products using the Customer Support Software; and
 - 4.2.3.3 Apply Products in bulk and mark those Products as provided free of charge (and use that indication on all accounting reports).The SI's Proposal shall include a plan for immediate fulfillment of Fare Card orders. [PSR: Approach to Order Fulfillment and Account Servicing]

5. Conversion and Migration

The SI shall develop a plan for balance conversion and group migration from the Existing System to the System. Such plan shall be subject to Design Review as described in Appendix 7. The Conceptual Design review shall consist of the PSRs required in this Section 5 and the Final Design Review shall be completed prior to the Pilots. [PSR: Conversion and migration plan conceptual design] [CDRL: Conversion and migration plan preliminary design] [CDRL: Conversion and migration plan final design]

5.1 Balance Conversion

- 5.1.1 The SI shall develop and implement a method to allow Users to convert valid AFC 1.0 stored value balances to Stored Value in an Account. The method:
 - 5.1.1.1 Shall prevent fraud (as described in Appendix 3.5) and apply continuous improvement to this process (monitoring for new cloning and forgery techniques and developing and implementing new ways to detect and thwart those techniques as they develop over time);

- 5.1.1.2 Shall require physical transfer of the original Media from the customer to the SI;
 - 5.1.1.3 Shall make available both an in-person and mail-in option, with the in-person option staffed by MBTA Personnel and the mail-in option operated fully by the SI; and
 - 5.1.1.4 Shall comply with the requirements for PII security as described in Appendix 3.1.
 - 5.1.2 In the Proposal, the Proposer shall identify its experience with handling similar requirements elsewhere, level of understanding of the complexity of the task, and approaches the Proposer recommends, based on the Proposer's experience, to reducing fraud in this process. [PSR: Conversion and migration plan conceptual design]
 - 5.1.3 Balance conversion shall be made available by the SI starting on the later of the Revenue Service Commencement Date and a date to be identified by the MBTA as part of Configuration (but no later than the Full Service Commencement Date). The SI shall demonstrate the balance conversion functionality to the satisfaction of the MBTA thirty (30) days prior to the Revenue Service Commencement Date and shall make this function available throughout the entire Term, unless so Configured by the MBTA.
 - 5.1.4 The SI shall make use of historical AFC 1.0 Media sales data that may be provided by MBTA in its existing raw format to inform the conversion process and prevent fraud.
 - 5.1.5 The SI shall make use of AFC 1.0 Media data layout information provided by MBTA to support the conversion process.
 - 5.1.6 The conversion rate shall be at the MBTA's discretion up to the full value (no loss of value) through Configurable balance conversions.
 - 5.1.7 The SI shall provide detailed accounting of all balance conversions. [CDRL: Report on balance conversions]
- 5.2 Group Program Migration
- The SI shall migrate all Existing System group accounts to the System, inclusive of all direct customer service, fulfillment, exception handling, Group Account creation, Group Administrator setup, training, Data cleansing and reconciliation, staged activation, and continuous improvement of the process based on Customer feedback, ensuring that all migrations are complete by the timeframes set forth in Appendix 5. No Products or Value shall be converted as part of this process.
- 5.2.1 The SI's Proposal shall explain its approach to Group Program migration. [PSR: Conversion and migration plan conceptual design]

6. Customer Service and Charges

6.1 Customer Service

- 6.1.1 The SI shall provide live phone support and resolution to the MBTA (and MBTA-designated MBTA Persons) for Account servicing issues that the MBTA or such MBTA Persons advises are unable to be completed via the System Website and Customer Support Software. These issues may include, for instance, resolution and escalation to the SI's senior staff of unfulfilled or incorrectly fulfilled orders, rare tasks, such as the handling of fraudulent Media discovered by the MBTA, lost Fare Cards for bulk orders and/or other complex tasks and all other Problems.
- 6.1.2 The SI shall provide, as part of the Administrator Interface, a facility to provide batched requests for a series of Fare Cards and other Credentials to disable, suspend, flag or other action, including the ability to batch all Accounts associated with a particular Group, and this facility shall also allow for the efficient and accurate importing of spreadsheets with lists of Account identifiers, Fare Card and Credential identifiers and/or another identification specific to a Group Account (with a limit no less than 50,000 items per

import and any greater limit to be proposed by the SI). The SI shall also provide support when order fulfillment is unsuccessful, including orders lost or damaged in shipping, failures in activation or incorrect orders.

6.1.2.1 The SI's Proposal shall specify a limit for the number of Fare Cards allowed in batch requests. [PSR: Approach to Order Fulfillment and Account Servicing]

6.2 Means of Payment

6.2.1 The System shall allow all means of payment set forth in Appendices 2.3, 3.6, 3.8, 3.9, and 4.7.

6.2.2 When adding or transferring Value or Products into an Account that has as its primary Credential a Contactless EMV Credential (including a Payment Card or NFC Device), the System shall ensure that such Value and Products were purchased using a Payment Card in accordance with Payment Industry Standards.

6.3 Charges for Shipping

6.3.1 The SI may not charge for shipping to the MBTA or the MBTA's third party contractors, and may not pass along any shipping or handling fees to Accounts for orders fulfilled to the MBTA or the MBTA's third party contractor. All shipping and handling fees are to be paid by the SI.

6.3.2 The SI shall:

6.3.2.1 Provide a no-charge shipping and handling option is available for orders that include Fare Cards not exceeding twenty (20) units, including for replacement Fare Card orders and for upgrading from a Temporary Fare Card to a Standard Fare Card;

6.3.2.2 Charge Customers directly for allowable shipping charges with no markup by the SI and no handling fee; and

6.3.2.3 Automatically issue Refunds to Customers if quoted shipping timeframes are not met and the policies of the shipping provider entitle the SI to a refund.

6.3.3 The SI shall not accept any incentive or compensation of any kind from the shipping provider related to shipping services provided in connection with the Project.

6.4 No Other Fees

6.4.1 In no circumstance shall the System charge any User any amounts other than:

6.4.1.1 Enablement Fees,

6.4.1.2 Fares and prices for Products as set by Fare Policy,

6.4.1.3 Shipping, as provided in Section 6.3 of this Appendix 4.4, and

6.4.1.4 For Custom Fare Cards as provided in Section 3 of this Appendix 4.4.

6.5 Receipt of Good Funds

6.5.1 Subject to Appendix 4.2, the System shall have a method to accept payment separately from order placement, and defer fulfillment of the order until payment is completed. [CDRL: Approach for separating unpaid orders]

6.5.2 The System shall also implement a mechanism for supporting and tracking payment on post-paid Accounts, including MBTA-Configurable credit limits, warnings, and shutoff points. The SI shall report status to the MBTA. [CDRL: Mechanism for supporting post-paid Account tracking]

6.6 Tracking and Visibility

The System shall allow the MBTA (and -designated MBTA Administrators) to see the status of Product and Fare Card orders placed for the purposes of customer service via the Administrator

Interface. The SI shall provide functionality for tracking customer service requests from the MBTA or Users, and shall resolve 99% of customer service requests within four (4) hours of submission (counting from 7am to 10pm on each Business Day).

7. MBTA Discretionary Refunds

- 7.1 The System shall provide the capability for the MBTA to request that a Refund be issued at MBTA discretion (an MBTA Discretionary Refund). This capability supplements the Technical Requirements relating to Automatic Refund processing.
- 7.2 When a User requests consideration for a Refund by way of the Customer Support Software or System Website and no Automatic Refund is due (e.g. there was neither a miscalculation nor an MBTA Service Failure), the System shall provide the MBTA with a list of such Refund requests with all the detail provided by the User along with statistics about the Account, including Inspection history, previous Refunds, and Account Balance before and after the Refund request.
- 7.3 Whether in response to a User's request for a Refund through the System or a customer service inquiry received directly by the MBTA, the System shall provide functionality through the Administrator Interface for a Configurable subset of MBTA Administrators to authorize MBTA Discretionary Refunds. The System shall permit separately Configurable authorization rules for Administrators for Direct Refunds and In-System Refunds; the System shall never issue an MBTA Discretionary Refund without such authorization being given by a Configured MBTA Administrator.
- 7.4 When an MBTA Discretionary Refund is applied as a Direct Refund, the amount of the Refund shall be returned to the Customer's form of payment (including Payment Card or ACH) within three (3) Business Days of the MBTA's authorization of the Refund. The amount shall be treated as Direct Refunds for purposes of Appendix 4.2.
- 7.5 When an MBTA Discretionary Refund is applied as an In-System Refund, the Refund shall be applied to the Account within ten (10) minutes of the MBTA's request. The amount shall not be treated as an addition or subtraction to Fare Revenue for purposes of Appendix 4.2.

8. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 4.4. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.6. [PSR: Proposer team experience: Fare Card and Order Fulfillment]

APPENDIX 4.5

REPORTING, DATA, AND RECONCILIATION

The Proposal shall address the Technical Requirements set forth in this Appendix 4.5 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Reporting, Data, and Reconciliation general approach]

1. Back-Up Data

The SI shall, each Operating Day, provide back-up Data documenting certain transactions occurring in Accounts. The back-up Data required under this Appendix 4.5 shall be in addition to the back-up information required in Appendix 4.2 and the Fare calculation outputs required in Appendix 3.7. The back-up information required under this Appendix 4.5 shall comply with the methods and standards defined in Appendix 4.2. Without limitation of the foregoing, the following transactions must be documented in back-up Data, and shall be considered "other sales and payment Data" for purposes of compliance with Appendix 3.1A: [CDRL: Back-up Data]

- 1.1 Transfers of Products between Accounts. If MBTA Configuration permits the transfer of a Product from one Account to another, the back-up Data must identify source and target Accounts, Products transferred, the policy basis which permitted the transfer, the authorizing party from the source Account, and the Sales Channel used to make the request.
- 1.2 Conversions of Products. If MBTA Configuration permits conversion and upgrade of Products (for example, using Stored Value to apply toward the cost of a Pass Product), the back-up Data must identify the Account, Products or Stored Value redeemed, and Products or Stored Value yielded, the policy basis which permitted the conversion, the authorizing party from the Account, and the Sales Channel used to make the request.
- 1.3 In-System refunds. If MBTA Configuration permits refunds of any Product or Stored Value within an Account that does not necessitate any direct refund to a User (for example, reinstating Stored Value charged for a Trip, or restoring a Pass Product to an unused status), the back-up Data must identify the Account, the Product, the how the refund was authorized (whether automatic or manual), and, for Automatic Refunds, the basis (e.g. a particular MBTA Service Failure), and for manual refunds, the authorizing MBTA Personnel.
- 1.4 Pay API transactions (as defined in Appendix 3.9). The back-up Data must contain Data on each stage of each Pay API transaction, including summary Data on the finalized pay amounts by transaction for each Integrated Service, and timestamped back-up Data on the initial pay request and any updates made to the pay request. Wherever MBTA Configuration designates particular properties for such transactions, those properties must be included in the back-up Data.
- 1.5 Waived Enablement Fees. If MBTA Fare Policy establishes an Enablement Fee, the back-up Data must identify each and every case of Fare Cards being Enabled without the payment of the Enablement Fee. The back-up Data shall identify the quantity of Fare Cards so enabled, the Fare Card manufacturing batch, the Fare Policy basis for the free Enablement (if the Enablement Fee

was waived automatically by the System), the authorizing MBTA Personnel, and the value of the Enablement Fee that would have otherwise applied.

- 1.6 Free rides and acceptance of AFC 1.0 Media. The back-up Data must identify each and every use of free Trips which begin with an accepted Tap. For purposes of this back-up Data, each class of free travel entitlement shall be Configurable by MBTA as to whether it is treated as a User Account or an MBTA Personnel Account. In the case of a User Account, free travel shall be documented in this back-up Data in a way that complies with the protections required in Appendix 3.1A. In the case of an MBTA Personnel Account, free travel shall be documented with Trip-level detail including locations and times. In both cases, the estimated Configured Fares for the travel (that would have been charged without the free travel entitlement) shall be calculated and provided in the back-up Data. Any acceptance by the System of AFC 1.0 Media shall be considered free travel for purposes of this Data.
- 1.7 Free orders for Products. The back-up Data must itemize any Product or Fare Card orders for which no payment is required, including those made by and for the MBTA and Retail Reload Locations as described in Appendix 4.4. The back-up Data must include Product and Media types, quantities, shipment locations, the reason why the orders were at no cost, the requesting party, and the Sales Channel used to make the request.
- 1.8 Overriding and failure to Tap. The back-up Data must provide summary statistics and detail about Trips which resulted in an Extension Fare or Penalty Fare being applied, identifying the Tap locations, and, in the case of an Extension Fare, the amount of the Extension Fare and the portion of the Trip to which it applied. This Data must not include any Account identifying information, so as to comply with the requirements of Appendix 3.1A.
- 1.9 Custom Fare Card orders. The SI shall provide reports on Custom Fare Card orders identifying the customer, the number of Fare Cards ordered and delivered per approved artwork, and the dates of actual and scheduled deliveries. [CDRL: Custom Fare Card order report]

2. Negative Balance Accounts

Daily negative balance reports shall identify all Accounts with negative balances, including prepaid, postpaid, and revolving Accounts, and, for each, shall identify:

- 2.1 Account type (Registered Account, Unregistered Account, Group Account).
- 2.2 Primary Credential type (Fare Card, Contactless EMV Credential, none).
- 2.3 Date when Account will be prevented from further use per the write-off handling requirements of Appendix 3.8, if any.
- 2.4 Amount of negative balance.

[CDRL: Negative balance reports]

3. Cash Handling Reports

Daily cash handling reports shall identify cash volumes handled for each Fare Vending Machine, counterfeits encountered, and any instances of theft, fraud or loss. [CDRL: Cash handling reports]

4. Processing Costs

If so Configured by the MBTA, the SI shall provide additional Data for every Payment Card transaction processed by the System. In each case, the Data provided shall represent the actual costs paid by the SI to a Payment Service Provider for the services noted, and shall be net of any discounts, rebates, and incentives the SI receives from any Payment Service Provider. Processing cost Data shall identify the following:

- 4.1 Payment Card transaction processing fees paid to the Acquirer, inclusive of everything except interchange and downgrades;
- 4.2 Payment Card interchange fees;
- 4.3 Payment Card downgrade fees; and
- 4.4 Retail Reload Location per-transaction commission and fee amounts.

[CDRL: Processing cost Data]

5. Real-Time Dashboards

The System shall make available easy-to-use web-based dashboards summarizing the status information in the Automated Monitoring Subsystem and other System Data, including:

- 5.1 User throughput by Location and on each Vehicle;
- 5.2 Problems reported or known to the SI, including those pending resolution; and those actively being addressed; and
- 5.3 High-visibility display of Problems potentially impacting MBTA Revenue collection (for example: open Gates, multiple Fare Vending Machines at a Location not fully functional), highlighting those Problems with the longest duration.

[CDRL: System status dashboard]

6. Self-Assessment and Reconciliation Program

- 6.1 The SI shall design and implement a self-monitoring program to ensure the MBTA that the Data reported by the System and used by the System in its computations and calculations reconciles properly. The Data reported must reconcile both within the System internally (across all outputs – for example, on-screen displays, printed reports, transmitted files) and externally with real-world User Interactions. The program shall include:
 - 6.1.1 SI Persons purchasing and using Products of various types, throughout the Term, and the SI then verifying that all such actual events are reported as they occurred;
 - 6.1.2 Continuous improvement and consideration for exception cases in the development of these processes;
 - 6.1.3 Engagement of independent parties to review discrepancies; and
 - 6.1.4 Disclosure and resolution processes.
- 6.2 The self-monitoring and reconciliation program shall be subject to Design Review, as described in Appendix 7. [CDRL: Self-assessment and reconciliation program conceptual design] [CDRL: Self-

assessment and reconciliation program preliminary design] [CDRL: Self-assessment and reconciliation program final design]

- 6.3 The SI shall implement the program starting within thirty (30) days of completion of the Final Design Review and prior to Pilot Phase 1.
- 6.4 The SI shall provide reports on the self-assessment and reconciliation program. [CDRL: Report on self-assessment and reconciliation program]

7. Auditability

The System shall be designed with auditability in mind. The SI's Proposal shall explain how this will be ensured, including specifically with regard to audits described in Articles 5 and 14 of this Project Agreement, data security audits (described in Appendix 3.1), data logs (described in Appendix 3.7), cash handling facilities (described in Appendix 4.1 and merchant accounts (described in Appendix 4.7). [PSR: Description of system auditability]

8. Standard Reports and Query Capabilities

- 8.1 Throughout the Contract Standards, where there is any requirement that the SI or the System report, provide Data, identify, or notify the MBTA; and for each piece of Data described in Appendix 3.1A other than Level 0 Data; the following standard report and query capability requirements exist and shall be made available by the SI for each such case:
 - 8.1.1 Both formatted reports (printable and with headings, summaries, totals, etc.) and adjustable query versions (with adjustable filters and sorting);
 - 8.1.2 Prototyping and iterative development by the SI with the MBTA to ensure the reports and queries meet the business need;
 - 8.1.3 An online catalog of all System reports and queries;
 - 8.1.4 MBTA-Configurable security rights by User Account and group for each type of report and query;
 - 8.1.5 Ongoing review and modification of reports and queries as Configuration changes;
 - 8.1.6 An archive of all prior executions of reports and queries; and
 - 8.1.7 Ability to run reports for prior time periods using both Data that was in effect as of a particular point in time and using the latest available Data, to support accounting and reconciliation analyses.

[CDRL: Report / data design] [CDRL: Online catalog of all System reports and queries] [CDRL: Archive of all System reports and queries]

- 8.2 Prior to the submission of any new type of report described in the Contract Standards, the SI shall submit a sample report to the MBTA for review and approval. [CDRL: Sample report]

9. Ongoing Ad-Hoc Data Analysis Services

- 9.1 Recognizing that the SI's standard reports and query capability may not fulfill all of the MBTA's needs, even with the data warehouse External Interface required, the SI is required to provide ongoing ad-hoc Data analysis support and report development to the MBTA.
- 9.2 This service includes analyzing the business need expressed by the MBTA, leveraging SI expertise on the System's Data formats and content, developing notes, samples, and questions for the MBTA to clarify the business need, executing the analysis, and returning the results formatted, summarized, and filtered in a manner consistent with the expressed business need.

- 9.3 Without limiting any other Contract Standard, the SI is not expected, as part of this requirement, to alter the Data collected or maintained by the System.
- 9.4 These services shall be provided by the SI to MBTA subject to the following limits:
- 9.4.1 The SI shall respond to up to two (2) requests per Business Day.
 - 9.4.2 For routine requests, the SI shall respond within four (4) Business Hours (such response time being inclusive of any analysis and back-and-forth questions with the requester) to ad-hoc Data analysis requests and shall deliver results within four (4) Business Hours after that. [CDRL: Routine request responses]
 - 9.4.3 For urgent requests (of which MBTA may make up to one per week), the SI shall respond within 0.5 Business Hour and deliver results within one (1) Business Hour after that. [CDRL: Urgent request responses]

10. Location Data

- 10.1 All Taps and other transactions occurring at all Devices and Retail Reload Locations shall include location as part of the required Data supporting those Taps and other transactions. Location Data shall also be reported on a time interval basis from certain Devices even if no Tap or transaction occurs, as set forth in this Section 10.
- 10.2 For Fare Vending Machines, and for Gates and their component Readers:
- 10.2.1 The location Data associated with Taps and other transactions shall include a unique identifier for the Device, the Station and Array in which the Device is located (if any), the physical address at which the Device is located, latitude and longitude, and any other information defined in Appendix 2.10 that must be maintained about POS Locations.
 - 10.2.2 The System shall have a method to automatically detect misconfiguration of a Device that causes it to report incorrectly assigned location Data, and the SI shall monitor and correct such misconfigurations.
 - 10.2.3 The unique identifiers used as part of the location Data must reconcile with the Data included in the inventory of POS Locations required in Appendix 2.10.
- 10.3 For Station Validators and their component Readers:
- 10.3.1 The location Data associated with Taps and other transactions shall include a unique identifier for the Device, the Station in which the Device is located, and the relative location within the Station where the Device is located.
 - 10.3.2 The relative location Data shall provide enough information for a reasonable person to identify the particular Device (among the multiple Devices which may be present at a Station), and shall be provided using a consistent convention which the SI shall propose for MBTA review and approval. [CDRL: In-Station relative Device positioning descriptors]
 - 10.3.3 The System shall have a method to automatically detect misconfiguration of a Device that causes it to report incorrectly assigned location Data, and the SI shall monitor and correct such misconfigurations.
- 10.4 For Inspection Devices:
- 10.4.1 The location Data associated with Inspections, Validation Taps, and record mode Taps shall include the latitude and longitude, MBTA Stop or Station identification number (if any), and other relevant Data as further defined in Appendix 2.7.
 - 10.4.2 On a time interval of every ten (10) minutes while an Inspection Device is powered on, the location Data specified in Section 10.4.1 shall be reported in the Automated Monitoring Subsystem.

- 10.5 For Vehicles, Vehicle Validators and their component Readers:
- 10.5.1 The location Data associated with Taps and other transactions shall include a unique identifier for the Device, latitude and longitude, the Stop or Station at which the Vehicle is located (if any), the MBTA's identifier for the Vehicle, the service which the Vehicle is operating (with Data including route, direction of travel, and Zone), and the relative location of the Device within the Vehicle.
 - 10.5.2 The relative location Data shall provide enough information for a reasonable person to identify the particular Device (among the multiple which may be present in a Vehicle), and shall be provided using a consistent convention which the SI shall propose for MBTA review and approval. [CDRL: On-Vehicle relative Device positioning descriptors]
 - 10.5.3 On a time interval of every two (2) seconds while any Vehicle on which a Vehicle Validator is installed is in Revenue Service, the location Data specified in Section 10.5.1 (excluding the relative location Data) shall be reported in the Automated Monitoring Subsystem for the Vehicle. Only one such report is required per time interval per Vehicle, regardless of the number of Vehicle Validators installed on the Vehicle.
- 10.6 For Retail Reload Locations:
- 10.6.1 The location Data associated with transactions shall include a unique identifier for the Retail Reload Location, the name of the Retail Reload Location, the physical address of the Retail Reload Location, latitude and longitude, and any other information defined in Appendix 2.10 that must be maintained about POS Locations.
 - 10.6.2 The unique identifiers used as part of the location Data must reconcile with the Data included in the inventory of POS Locations required in Appendix 2.10.
- 10.7 For Readers as part of a Reader Expansion as defined in Appendix 2.8:
- 10.7.1 The location Data associated with Taps and other transactions shall include a unique identifier for the Reader, latitude and longitude, the Stop or Station at which the Reader is located (if any), the service (including such Data as Mode, route, direction of travel, and Zone), and an identifier for the host device.
 - 10.7.2 On a time interval of every two (2) seconds while a Reader is powered on, the location Data specified in Section 10.7.1 shall be reported in the Automated Monitoring Subsystem, unless the MBTA, acting reasonably, approves a less frequent time interval as part of the Expansion.
- 10.8 Accuracy, Precision, and Sources
- 10.8.1 Where location Data is required to include latitude and longitude, it shall all be provided using a consistent coordinate system, including units and map projection, which the SI must identify. [CDRL: Coordinate system]
 - 10.8.2 Where location Data is required to include latitude and longitude, the Data shall be as precise and accurate as specified by GPS Standard Positioning Service (SPS) Performance Standard using a Global Positioning System receiver supporting at least 32 channels, during times when the Device is not at or between underground Stations with Gates.
 - 10.8.3 Where location Data is required to include latitude and longitude, the Data shall seamlessly incorporate real-time Vehicle position information from the MBTA published interfaces as defined in Appendix 3.10 during times when the Device is at or between underground Stations with Gates. The System shall not use the MBTA published interfaces as a source for location Data when Devices are not at or between underground Stations with Gates, but may use the MBTA published interfaces as part of a program to monitor and improve accuracy of location Data generally.

- 10.8.4 No System Element shall connect to or use any existing or future MBTA technology installed on Vehicles as a source for location Data except as allowed in Section 10.8.3.
 - 10.8.5 Where location Data is required to include street addresses, those addresses must be compliant with FGDC-STD-016-2011, the United States Thoroughfare, Landmark, and Postal Address Data Standard.
- 10.9 MBTA Access
- 10.9.1 For the requirements of this Section 10 that relate to the required location Data associated with Taps, Inspections, and transactions, the System shall provide the MBTA with access to the location Data by way of the Automated Monitoring Subsystem, the reports and queries defined in this Appendix 4.5, and the data warehouse integration defined in Appendix 3.10.
 - 10.9.2 For the requirements of this Section 10 that relate to the required location Data to be provided on a time interval basis, the System shall provide the MBTA with access to the location Data by way of all the methods described in Section 10.9.1, and also on a real-time basis using the Location Data API defined in Appendix 3.9.

11. Asset Management

The SI shall provide quarterly asset management reports documenting all Devices deployed at all Locations and on all Vehicles, including estimated depreciated value. [CDRL: Quarterly asset management reports]

The SI's Proposal shall describe its methodology for asset management, which shall be subject to MBTA approval. [PSR: Methodology for asset management]

12. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 4.5. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.11, 4.3 and 4.6. [PSR: Proposer team experience: Management, maintenance and reporting]

APPENDIX 4.6

MAINTENANCE AND SELF-REPORTING

Availability of the System, including all System Elements must be monitored and maintained by the SI in accordance with this Appendix 4.6 and all other Contract Standards.

The Proposal shall address the Technical Requirements set forth in this Appendix 4.6 in a manner that is comprehensive, responsive to the Project objectives, credible, and compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. [PSR: Maintenance and Self-Reporting general approach]

As part of the Technical Proposal evaluation, the SI shall perform a demonstration of the most similar such processes to those described in this Appendix 4.6 used in an existing deployment delivered by the SI. [Technical Proposal Evaluation: Demonstration]

1. General

1.1 Work Schedule and Environment

All System maintenance shall be accomplished without disruption to Transportation Network operations and maintenance, unless the SI receives prior approval from the MBTA, at the MBTA's discretion.

- 1.1.1 It may be necessary to perform maintenance on weekends and overnight to ensure no disruption to Transportation Network operations. Vehicles and Stations may not be available for the SI to undertake maintenance activities during Peak Operating Times, as established from time to time by the MBTA. The SI must be familiar with MBTA operational and facility schedules and work with and around those schedules in performing maintenance.
- 1.1.2 The Availability Payment includes all compensation to the SI for the performance of all maintenance obligations. No additional weekend, overnight, holiday, or other similar premiums will be paid to the SI.
- 1.1.3 The SI shall ensure that when components of the Transportation Network not related to the System are removed, temporarily altered or otherwise affected during its maintenance work or otherwise, the non-System component shall be returned and restored to its original condition or better. By way of example, when a Vehicle panel is removed while performing maintenance, the panel must be re-secured in accordance with all manufacturer's specifications and MBTA requirements, with all fasteners in place.
- 1.1.4 The SI is responsible for the cleanup and disposal of any debris, trash, waste, etc. generated during the maintenance process in accordance with the Contract Standards. By way of example only, areas to be cleaned up shall include Vehicle defroster ducts.
- 1.1.5 In the event that the SI damages any component not related to the System in a Location or Vehicle, SI shall promptly notify in writing the person or persons designated by the MBTA and will be responsible for all ensuing costs.

1.2 Vehicles

Any automobiles that the SI uses in performing maintenance services that will be parked at or near any Location must be clearly marked as official SI vehicles.

- 1.3 Parking
Parking costs are the responsibility of the SI. The MBTA will only provide parking at bus garages and rail carhouses.
- 1.4 Parts Storage
The MBTA will provide the SI with access to limited storage space for parts, consumables, or tools at designated facilities (Parts Storage Facilities), subject to the terms and conditions of this Section 1.4. All requirements related to MBTA-Provided Facilities apply to these Locations, and are described in greater detail in Section 6. The SI may not receive shipments of any parts, tools, or consumables at an MBTA facility without prior approval from the MBTA and without the presence of an SI Person to receive the shipment.
- 1.4.1 Locations. The MBTA currently utilizes the following locations for AFC 1.0 storage
- 1.4.1.1 Dedicated rooms at all bus garages and railcar houses
 - 1.4.1.2 Dedicated rooms at the following Rapid Transit stations: Airport, Forest Hills, Harvard, JFK/UMass, North Station, Quincy Center, South Station, Sullivan
 - 1.4.1.3 Shared/mixed use rooms at the following Rapid Transit stations: Arlington, Downtown Crossing
- 1.4.2 Timeline. The SI shall not have access to Parts Storage Facilities until sixty (60) days after the Full Service Commencement Date.
- 1.4.3 The SI will be required to utilize facility access controls approved by MBTA security Personnel (see Attachment 2 to Appendix 2.5). The SI may not add any locks to the doors of the Parts Storage Facilities, but may add locked cages or cabinets inside.
- 1.4.4 Condition. The SI must accept the Parts Storage Facilities “as is”, and the responsibility for cleaning, outfitting or maintaining the interior of the facilities falls solely upon the SI.
- 1.5 Wear and Tear, Vandalism
- 1.5.1 Because of the harsh environment in which the System operates, System Elements will be subject to both normal wear and tear (in the manner understood in Good Industry Practice) and damage from environmental and human interaction. The SI shall be responsible for resolving all failures of System Elements promptly and efficiently, whether from manufacturing or design defect, wear and tear, or any other damage regardless of the cause. The SI shall perform all such work and, except to the extent provided in this Project Agreement in respect of Compensation Events, be responsible for all associated costs.
- 1.5.2 The SI, as part of the required maintenance, shall keep all Devices in a state of reasonably clean appearance consistent with Good Industry Practice and including (a) ensuring that all labels and placards are properly affixed and readable, (b) ensuring that tape or other temporary repairs are not visible to Users, (c) ensuring that Payment Card, coin, and bill acceptors and coin and receipt return areas are checked for and free of any foreign substances such as glue, any sticky sugary substances, spider webs, insect larva and jammed material (i.e. paper, wood, etc.), and (d) ensuring that User Interfaces are visible, not damaged, and are free of excessive dust or dirt build up.
- 1.6 Scope Exclusions
The scope of the SI’s maintenance obligations includes every System Element as well as all additions or modifications that the SI makes at any Location or Vehicle, regardless of whether the addition or modification is to a System Element or a component not related to the System, subject only to the following exclusions:
- 1.6.1 In-Vehicle power cabling, starting for each Vehicle upon completion of a burn-in period.
- 1.6.1.1 The burn-in period for each Vehicle shall:
 - 1.6.1.1.1 Begin at the later of (a) the Full Service Commencement Date, or (b) the installation of any System Element on the Vehicle.

- 1.6.1.1.2 End after ninety (90) consecutive service days on which no Performance Failures occur which result from a failure of in-Vehicle power cabling. For purposes of this Section 1.6.1.1.2, service days are days when a Vehicle is deployed into Revenue Service for any part of the day. Days on which the Vehicle is not in Revenue Service are not counted in determining the number of consecutive service days and do not restart the burn-in period.
- 1.6.1.1.3 Restart upon any Incident impacting any System Element on that Vehicle.
- 1.6.1.2 The SI shall develop a method to track information related to the installation of in-Vehicle power cabling and propose it to MBTA. [CDRL: Method to track installation of in-Vehicle power cabling]
- 1.6.2 Without limiting any other responsibility of the SI hereunder, in respect of maintenance of AFC 1.0 Equipment in System Gates and AFC 1.0 Gates during the timeframes set forth in Appendix 2.3:
 - 1.6.2.1 For AFC 1.0 Gates installed pursuant to Gate Option 2 or 3:
 - 1.6.2.1.1 The SI shall be responsible for troubleshooting, identifying symptoms, notifying the MBTA of performance issues and swapping of AFC 1.0 Equipment components in and out of the AFC 1.0 Gates or System Gates. The SI shall also be responsible for delivering to the MBTA any failed components. The MBTA shall be responsible for repairing such failed component or supplying the SI with a replacement for such AFC 1.0 Equipment.
 - 1.6.2.1.2 The SI shall develop an AFC 1.0 Equipment component exchange coordination process, and it shall be subject to Design Review as described in Appendix 7. [CDRL: AFC 1.0 Equipment maintenance coordination process conceptual design] [CDRL: AFC 1.0 Equipment maintenance coordination process preliminary design] [CDRL: AFC 1.0 Equipment maintenance coordination process final design]
 - 1.6.2.2 For AFC 1.0 Gates installed pursuant to Gate Option 4:
 - 1.6.2.2.1 The SI shall be responsible for maintenance of everything added or modified by the SI (directly or by including applicable requirements in the DB Plans and Specifications) to the AFC 1.0 Gate and to the Station (including CN Equipment and power facilities), and the MBTA shall be responsible for maintenance of the aspects and elements of each AFC 1.0 Gate which were present as of the commencement of Installation for each AFC 1.0 Gate and, except to the extent modified by the SI (directly or by including applicable requirements in the DB Plans and Specifications) the power and communication facilities upon which each AFC 1.0 Gate relies.
 - 1.6.2.2.2 The SI shall be responsible for troubleshooting and identifying symptoms of any apparent failures of the AFC 1.0 Gate up to the point of interface with the System Elements in the Gate. The SI's troubleshooting responsibilities shall include utilizing all testing and monitoring capabilities of the MBTA Fare Gate Interface Controller Board (ICB) accessible via the ICB's serial interface to the System Elements in the Gate.
 - 1.6.2.2.3 The SI shall develop an AFC 1.0 Gate failure coordination process to exchange information on failures and repairs between the SI and

- the MBTA, and it shall be subject to Design Review as described in Appendix 7. [CDRL: Gate failure coordination process]
- 1.6.2.2.4 MBTA will report failures of AFC 1.0 Gates reasonably known to the MBTA to the SI and the status of the MBTA's resolution of those failures.
- 1.6.2.2.5 The SI shall be responsible for reporting all failures of AFC 1.0 Gates reasonably known to the SI in accordance with the approved coordination process; in the event the SI does not do so, and when a real or apparent failure of the AFC 1.0 Gate prevents operation of the System Elements installed in or on the AFC 1.0 Gate, those System Elements will not be considered to be operating in accordance with the Technical Requirements and the Reporting Failure Factor will apply to any relevant Performance Deduction.
- 1.6.2.2.6 Cure Periods for System Elements installed in or on an AFC 1.0 Gate will be paused: (a) from the time the SI reports a failure of the AFC 1.0 Gate in accordance with the approved coordination process until the time the MBTA resolves the failure or completes its investigation and finds no fault, and (b) from the time the MBTA reports a failure of the AFC 1.0 Gate until the time the MBTA resolves the failure or completes its investigation and finds no fault.
- 1.7 Network Access for Laptops and Other Technology
The MBTA will not provide wired or wireless network connectivity to any SI maintenance Personnel. SI maintenance Personnel may not use any MBTA wired or wireless network connectivity. The SI is responsible for providing at its expense all laptops and mobile devices that SI maintenance Personnel may require to perform maintenance work.
- 1.8 Location Coordination
SI must coordinate all Location and Vehicle maintenance work with MBTA Personnel. To do so, the SI must review and become familiar with MBTA policies, procedures and schedules and meet with managers of each Location where the SI will be working. The specific procedures for Location and Vehicle maintenance work will vary depending on the work to be performed and the Location of the work. By way of example, the following procedures are the types which the SI must discuss and agree to for each Location:
- 1.8.1 Upon arrival at a Location and before performing any maintenance work, the SI must check in with a person designated by the MBTA (for example, the on-duty garage/repair foreperson). Just before departure from the Location, the SI must also check out with a person designated by the MBTA.
- 1.8.2 The SI must work, as appropriate, with MBTA-designees for certain areas with access restrictions, including: closets, rooms and facilities adjacent to an active right-of-way; areas with controlled access points; and Commuter Rail non-station facilities.
- 1.8.3 The SI must work with designated MBTA Persons to determine the needs for worksite set-up and break-down at the start and end of any working period at each Location and shall comply with all reasonable instructions and directives from MBTA Persons regarding the same.
- 1.9 AFC 1.0 Equipment Storage
1.9.1 The SI shall safely and securely package AFC 1.0 Equipment removed per Appendices 2.12 and 2.13, ship it to an SI-managed central location and store it securely and in an

- environment consistent with the documented Existing System storage environmental limits (see the Reference Documents).
- 1.9.2 The SI must store the AFC 1.0 Equipment removed for a period of two (2) years from the date of removal, or less at the discretion of the MBTA. MBTA will advise the SI of one of the following two dispositions prior to the end of that storage period, and the SI shall take all steps needed to bring about the disposition: either (a) scrap or (b) safely and securely package for delivery (delivery to be paid for by the MBTA). In all cases, the SI shall keep inventory records and provide those to the MBTA. Upon request, the MBTA may direct that certain items of AFC 1.0 Equipment be scrapped and others be packaged for delivery. The MBTA shall be entitled to all proceeds from the sale of AFC 1.0 Equipment.
 - 1.9.3 The SI shall be responsible for the security of all stored AFC 1.0 Equipment in the possession of any SI Person and must employ controls and monitoring in accordance Good Industry Practice to protect such equipment from theft, including theft or misappropriation of any Intellectual Property Right associated with any such equipment.
- 1.10 SI Personnel may, when it is safe to do so, cycle the main battery switch and/or the master run switch on MBTA buses. Starting or moving MBTA buses will require assistance from MBTA staff.
 - 1.11 SI will communicate with MBTA Personnel at garages and at the operations control center to facilitate tracking Vehicles, determining Vehicle pullback schedules and securing access to Vehicles.
 - 1.12 For the protection of SI Personnel, MBTA Personnel, Users, and others, the SI must comply with any MBTA directives, orders, and rules and/or direction from MBTA Personnel with respect to safety and security. This may include attending MBTA-organized training classes.

2. Monitoring

2.1 Types of Monitoring

- 2.1.1 The System must include an Automated Monitoring Subsystem (AMS) that monitors any aspects of System Element Availability and performance which can be systematically monitored, and does so in a fully automated way using technology in accordance with Good Industry Practice.
- 2.1.2 The SI must provide a Supplemental Monitoring Process (SMP) involving technology, business process and SI Personnel that monitors any aspects of System Element Availability and performance which are not systematically monitored in an automated fashion by the Automated Monitoring Subsystem.
- 2.1.3 Together, the Automated Monitoring Subsystem and Supplemental Monitoring Process must comprehensively monitor Availability and performance for all System Elements in accordance with Good Industry Practice.
- 2.1.4 The Proposal shall identify the portions of the System monitored by the Automated Monitoring Subsystem and Supplemental Monitoring Process. [PSR: Difference between monitoring processes]

2.2 Monitoring Plan

The SI must propose and implement a Monitoring Plan.

- 2.2.1 The Monitoring Plan must include, at a minimum:
 - 2.2.1.1 A detailed explanation, with example figures and graphics, of the implementation process for the Automated Monitoring Subsystem and Supplemental Monitoring Process;
 - 2.2.1.2 A table listing every requirement (broken out by every paragraph or outline level change) in Appendices 2, 3, and 4 and noting, for each, whether the

- Automated Monitoring Subsystem or Supplemental Monitoring Process will be used;
- 2.2.1.3 A table listing all the ways the SI knows that each System Element could fail which are not handled by the requirements table described in Section 2.2.1.2, and noting, for each, whether the Automated Monitoring Subsystem or Supplemental Monitoring Process will be used; and
 - 2.2.1.4 An explanation of how the SI will maximize use of the Automated Monitoring Subsystem and minimize reliance on the Supplemental Monitoring Process described in this Appendix 4.6.
- 2.2.2 The Proposal shall include a sample Monitoring Plan which contains the information described in Section 2.2.1 for a representative subset of Contract Standards and System Elements, or shall be an in-use plan from a comparable transit fare system project. If a comparable plan is submitted, a narrative must accompany the plan describing how the plan would be adjusted to fit MBTA-specific requirements. [PSR: Sample Monitoring Plan]
- 2.2.3 The complete Monitoring Plan covering all Contract Standards and System Elements shall be submitted to the MBTA within one hundred and twenty (120) days after the Effective Date. [CDRL: Monitoring Plan]
- 2.2.4 The SI shall redevelop the Monitoring Plan (and re-do any monitoring implementation) whenever either:
- 2.2.4.1 Less than 90% of all failures of compliance with the Contract Standards occurring in a month are detected through the Automated Monitoring Subsystem or Supplemental Monitoring Process (this shall be a triggering Month); The new Monitoring Plan must be developed within one month after the end of the triggering Month and explain how the SI intends to ensure that 90% or greater of Performance Failures occurring during a Month will be identified by either the Automated Monitoring Subsystem or the Supplemental Monitoring Process; or
 - 2.2.4.2 Five (5) or more Performance Failures occur in a month in respect of a portion of the Technical Requirements for which a manual monitoring alternative is elected by the SI, as described in Appendix 2.3 which are not detected and reported in accordance with the Monitoring Plan and the requirements set forth in Appendix 8.
[CDRL: Updated Monitoring Plan]
- 2.3 Automated Monitoring Subsystem
- 2.3.1 The Automated Monitoring Subsystem must monitor all System Elements including all hardware, software, Configuration, and other services at all levels of the System (including on Devices).
 - 2.3.2 Industry standard protocol and Good Industry Practice must be used for all monitoring data exchange between System Elements, except for simulated transactions (interactions created by the SI for testing purposes). No proprietary monitoring data exchange instrumentations are allowed when Simple Network Monitoring Protocol, open standards or equivalent could handle the task.
 - 2.3.3 The Automated Monitoring Subsystem must provide:
 - 2.3.3.1 Coverage at a minimum of all metrics defined in the Contract Standards.
 - 2.3.3.2 Data for transaction time by Users and simulated transaction time by the SI on a rolling basis.
 - 2.3.3.2.1 The SI shall propose which System Elements and transactions will be handled by the AMS, and to what degree simulated transactions will be used. [PSR: Description of System Elements and transactions]

- 2.3.3.2.2 Transaction times must be provided at a minimum for every User Interaction with the System, and must include measurements of initial User Interaction, System processing, actions taken in response, and any subsequent User Interaction; for example, for a Gate entry, the following would be captured: the initial presentation of the Media/Credential, the time for the Reader to read the Media/Credential, the time for the Reader to return feedback, the time for the Gate to display the result, the time for the Gate to begin and complete opening, the time taken by the User to begin passing through the Gate, the time for the Gate to begin and complete closing, and an indication of the occurrence of any other potentially intersecting events (another User exiting through the Gate during this transaction, for example).
- 2.3.3.3 For each System Element, each of the following, or, to the extent the specific Data listed below is not applicable to the proposed System, an alternative piece of Data, with explanation from the SI as to how the same goals are accomplished.
- 2.3.3.3.1 Serial number;
 - 2.3.3.3.2 Software, firmware, hardware versions active and staged;
 - 2.3.3.3.3 Operating status (e.g., normal, test, fault, being maintained, etc.);
 - 2.3.3.3.4 Current role/function/type; and
 - 2.3.3.3.5 A heartbeat or similar capability.
- [CDRL: System Element Data in AMS]
- 2.3.3.4 A centralized AMS database containing a record of event and status monitoring and aggregation shall be made available to the MBTA via a web interface with the following features: access to graphical and tabular interfaces, filtering and sorting capability, export and download capability, and historical Data stored and accessible online for at least twelve (12) Months from the date of input.
[CDRL: AMS database]
- 2.3.3.5 Plain-English Documentation of all monitored objects and attributes for all System Elements, including an explanation of the possible values for each object and the meaning of the values (in terms that are relevant to the MBTA, describe the relationship between and among the System and each System Elements, and include clear and complete definitions that link to the metrics contained in the Key Performance Indicators where applicable). For instance, an attribute might be called “Display Brightness” and the possible values are any integer between 1 and 10. Those integers represent 10%-100% of the possible brightness of the display. [CDRL: Monitored objects and attributes Documentation]
- 2.3.3.6 Monitoring of the following specific events:
- 2.3.3.6.1 Device status changes;
 - 2.3.3.6.2 Power failures;
 - 2.3.3.6.3 Configuration changes;
 - 2.3.3.6.4 Communication failures; and
 - 2.3.3.6.5 Maintenance actions.
- 2.3.3.7 Automatic discovery of Devices and other non-System devices and a mechanism for alerting the MBTA and SI to unknown, un-Configured or improperly configured Devices and/or non-System devices.

- 2.3.3.8 Sorting of active System Element status issues by severity/criticality, similar to categorization provided for the Performance Tracking System (see Section 3) and linked to the categorization set out in Appendix 8 (Payment Mechanism).
[PSR: Implementation process for Automated Monitoring Subsystem]

2.4 Supplemental Monitoring Process

- 2.4.1 The Supplemental Monitoring Process must set out a procedure for monitoring and ensuring compliance with the Contract Standards for each requirement not addressed by the Automated Monitoring Subsystem set forth in Section 2.3, including aspects such as the following:
 - 2.4.1.1 Frequency and level of sampling and inspections;
 - 2.4.1.2 Recordkeeping and test procedures; and
 - 2.4.1.3 Triggering events and measurements that indicate a Problem.
- 2.4.2 The SI shall provide Documentation explaining the proposed procedure for monitoring and ensuring compliance with the Availability requirements through the Supplemental Monitoring Process to the MBTA. [CDRL: SMP Documentation]
- 2.4.3 The SI shall provide an electronic recordkeeping process to monitor staff recording maintenance labor efforts with results directly input into the electronic process in real time.

3. Notification and Tracking

- 3.1 The SI shall provide a Performance Tracking System (PTS) by which the MBTA can notify the SI of Problems with any System Element and get instant status updates on Problems.
- 3.2 The PTS shall be implemented and operated by the SI in a manner consistent with Good Industry Practice. The PTS must include, at a minimum:
 - 3.2.1 The ability for the MBTA to report issues (notifications) to the SI via:
 - 3.2.1.1 Telephone with a live person; and
 - 3.2.1.2 Web interface.
 - 3.2.2 The PTS must be available 24 hours per day, every day
 - 3.2.3 The MBTA must be able see the status of the SI's response to PTS notifications. The PTS must include a ticketing system for logging and tracking issues, attaching files, linking related tickets and categorization of issues.
 - 3.2.4 The PTS must retain all notifications and tracking information for the duration of the Term and should provide reporting functionality to enable the SI and MBTA to track performance over time.
- 3.3 The time of the MBTA's PTS interaction will be the time of the notification for the MBTA Performance Failure Notice or other purposes. If the SI telephone and/or web service is not available, the time of the MBTA's first attempt will be the time of the notification.
- 3.4 The Proposal shall include a description of the Performance Tracking System. [PSR: Performance Tracking System]

4. Preventative Maintenance

- 4.1 The SI shall propose and implement a Preventative Maintenance Plan and process and update the Plan annually without limitation, the Preventative Maintenance Plan must include:
 - 4.1.1 Preventative maintenance processes and standard intervals for each System Element for which the SI plans preventative maintenance;
 - 4.1.2 A schedule of frequency (time, etc.) and cycle (usage, etc.) triggers for each level and type of preventative maintenance;

- 4.1.3 Approximate amount of effort (hours, etc.) required for each preventative maintenance level and type; and
- 4.1.4 Parts required for each preventative maintenance level and type.
[PSR: Preventative Maintenance Plan] [CDRL: Updated Preventative Maintenance Plan]
- 4.2 The SI shall maintain all Software to meet the functional and non-functional requirement of the Contract Standards. This requirement includes maintaining all platforms, APIs, third party tools and components, and other Software at current versions.
- 4.3 At least thirty (30) Days prior to the commencement of a Month, the SI shall provide to the MBTA a schedule for the preventative maintenance work to be undertaken during that Month. As part of that schedule, the SI may propose scheduled downtime of System Elements for preventative maintenance. If and when accepted by the MBTA, this scheduled downtime will be reflected in the calculation of System Availability Deductions and excluded from Performance Deductions. In no event shall scheduled downtime:
 - 4.3.1 Be scheduled or applied retroactively;
 - 4.3.2 Impact more than one Device at a Location or on any Vehicle during MBTA Peak Operating Times; or
 - 4.3.3 Occur during an event as specified in Appendix 8 (Payment Mechanism); or
 - 4.3.4 Impact the System Website, Customer Support Software, Mobile Fare Card, APIs, and Account management functionality during Operating Times; or
 - 4.3.5 Cover more than 1.0% of the time such System Element is required to be in service.
[PSR: Downtime schedule] [CDRL: Updated downtime schedule]

5. Corrective Maintenance

- 5.1 Whether identified through monitoring or notification (by the MBTA or User interaction), any actual or apparent Problem with the System must be responded to and resolved by the SI according to Good Industry Practice or within the timeframes set out in Appendix 8 (Payment Mechanism).
- 5.2 All System errors or defects, whether addressed in Key Performance Indicators or not must be corrected to assure proper function of the System. Errors and defects not covered by the Key Performance Indicators shall be corrected promptly in accordance of Good Industry Practice. The time period to correct errors and defects must be the shortest feasible time, consistent with hardware, software, and installation constraints and as determined by reference to Good Industry Practice.
- 5.3 Recurring Problems and root cause analysis
If similar Problems recur, the SI must analyze the Problem to determine the root cause, and implement a permanent solution to prevent recurrence. Results of that analysis and corrective work must be included in the Monthly Performance Reports.
- 5.4 No exclusion for replacement and rework
If the System does not perform properly in accordance with the Contract Standards, the SI is responsible for performing all maintenance as set forth in this Appendix 4.6. All such work shall be included in the SI's maintenance obligations, and is not limited to preventative and corrective repair in-place work. If the same or similar failure occurs more than three (3) times in a Month, the SI shall modify, rework, improve or replace any System Element as necessary to eliminate recurrence and all such work is included in the required maintenance.
- 5.5 No Trouble Found
If an apparent Problem cannot be verified by the SI, the following requirements apply:

- 5.5.1 For notifications, the SI shall provide a response in writing to the MBTA, and record the notification and updates relating to the apparent Problem on the PTS, explaining what analysis was performed, what System Elements were tested, the results of the testing and analysis, and why the SI believes that no actual Problem existed. This must include, for example, a chronology of User Interactions coincident to the apparent Problem. For cases in which the MBTA is not satisfied with the notification response, further analysis as described in Section 5.5.2 must be performed. [CDRL: Notification response]
- 5.5.2 For cases in which similar apparent Problems recur or the MBTA is not satisfied with the notification response, the SI shall further analyze the apparent Problems, propose changes to the System or its Configuration to reduce the occurrences, request approval from the MBTA, and implement any approved changes. [CDRL: Problem analysis Remediation Plan]

6. MBTA-Provided Facilities

- 6.1 If the System uses or relies upon MBTA-Provided Facilities (as defined in Section 6.3), the SI is responsible for maintaining all aspects of the System (including, for example, cabling and conduit), up until the exact location/point at which the interface is made between the System and the MBTA-Provided Facility.
- 6.2 Subject to Section 6.5, the SI may request that the MBTA resolve any issues with MBTA-Provided Facilities.
- 6.3 “MBTA-Provided Facilities” shall mean the following:
 - 6.3.1 Power at Rapid Transit Stations (excluding Surface Light Rail and Silver Line Stations) where power has been provided by the MBTA for use by the SI in connection with the System;
 - 6.3.2 MBTA Layer 2 Services;
 - 6.3.3 Vehicle elements (e.g. stanchions, posts) on which SI Devices are physically attached;
 - 6.3.4 Vehicle power cabling to the extent excluded from the scope of maintenance in Section 1.6;
 - 6.3.5 Parts Storage Facilities to the extent excluded from the SI’s responsibility described in Section 1.6; and
 - 6.3.6 AFC 1.0 Equipment to the extent excluded from the scope of maintenance in Section 1.6.
- 6.4 The SI shall maintain a master list of MBTA-Provided Facilities on which the System relies; items can only be added to the list with MBTA approval. [CDRL: List of MBTA-provided facilities on which the System relies]
- 6.5 The SI shall provide assistance to the MBTA in troubleshooting Problems with all interfaces between the System and MBTA-Provided Facilities. For example, the SI may be directed to: participate in a test ride on board a Vehicle with MBTA Personnel to assess whether a Vehicle Validator is intermittently failing under vibration.
- 6.6 The SI will be responsible for performing basic diagnostics on MBTA-Provided Facilities to establish a potential cause of any Performance Failure, which has impacted a System Element, prior to Handoff to the MBTA. By way of example, this could include testing a System Element with power from another source or swapping components with known-good ones.
- 6.7 The SI shall develop and implement a Handoff coordination process that accounts for and adapts to the MBTA’s operating practices, and the SI shall continue to refine and improve the process over the Term. The Proposal shall provide an explanation of the SI’s experience with coordinating such

activities with transit agency customers. [PSR: Handoff coordination experience] [CDRL: Handoff coordination process]

- 6.8 If, after Handoff, the MBTA, acting reasonably, confirms that the SI-reported failure of an MBTA-Provided Facility occurred, a Relief Event shall be deemed to have occurred as of the time of the reported failure and the SI shall be entitled to relief as and to the extent provided in Article 13 of the Project Agreement.
- 6.9 The SI shall be responsible for monitoring the status of each reported failure upon Handoff on a daily basis (and following up if no action on the part of the MBTA is observed) and then re-visiting the System Element to confirm System functionality.

7. Access-Related Relief Events

- 7.1 If the SI is specifically denied access to a Location by MBTA Personnel or the Location's owner or operator (excluding any Retail Reload Locations), and this prevents the SI from performing maintenance, the denial of access may constitute a Relief Event as and to the extent provided in Article 13 of the Project Agreement, subject to the SI demonstrating that reasonable advance attempts to schedule and gain access were made. Documentation of those attempts must accompany any Relief Event request.
- 7.2 If a Vehicle or Inspection Device is not available to be accessed by the SI to undertake preventative maintenance in accordance with the Preventative Maintenance Plan or to Rectify a Performance Failure, and SI demonstrates (in writing to the MBTA) that it has taken all reasonable efforts to attempt to locate and secure access to the Vehicle or Inspection Device, the unavailability of the Vehicle or Inspection Device shall constitute a Relief Event as and to the extent provided in Article 13 of the Project Agreement. Simply being unable to locate the Vehicle without any further investigation is not sufficient to qualify for a Relief Event. The SI must, for example, coordinate with garage personnel and use MBTA open data APIs to track Vehicles and schedule accordingly. [CDRL: Description of reasonable efforts]

8. Retrieving Taps

- 8.1 The SI shall ensure that all Taps are received from Readers and Inspection Devices and processed timely, as set out in Appendix 3.4, whether through automatic transmission or Manual Retrieval by the SI.
- 8.2 If a Reader and/or Inspection Device is offline, the SI shall take affirmative steps to investigate, identify and resolve the issue. The only permissible reasons for a Reader to be offline are:
 - 8.2.1 For Readers in Vehicle Validators, that the Vehicle is not in Revenue Service (which the SI must identify by reviewing MBTA records through Location coordination); or
 - 8.2.2 For Readers in Station Validators and Gates, that construction or other MBTA activity has taken the Device out of Revenue Service.
- 8.3 As part of the required maintenance and its Monitoring Plan, the SI shall manually retrieve Taps from any offline Readers and Inspection Devices.
- 8.4 When a Reader has been offline for 24 hours, the SI shall retrieve all Taps from that Reader within 24 hours thereafter (i.e., within 48 hours of the Reader going offline).

- 8.5 If a Reader remains offline for more than 48 hours for any reason other than the permissible reasons identified in Section 8.2, the SI shall retrieve Taps from that Reader at least once every 24 hours thereafter, with no exceptions for weekends or holidays.
- 8.6 The SI shall develop a coordinated process with the MBTA for access to Inspection Devices to ensure taps are retrieved from any offline Inspection Devices within 48 hours of any Inspection Device going offline.
- 8.7 Manual Retrieval of Taps is not subject to Supervening Event relief. For example, the SI must be able to retrieve Taps from both Readers and Inspection Devices even if the device does not have power.
- 8.8 The SI shall propose the technical method to be used to manually retrieve Taps and explain how it ensures compliance with the Information Security Plan (see Appendix 3.1) requirements and guarantees that Taps cannot be lost. [PSR: Manual Tap retrieval method]

9. Inspection Device Servicing

- 9.1 The SI shall exchange Inspection Devices, stock spare Inspection Devices and consumables (including paper and batteries) for Inspection Devices, and provide charging facilities within each of the following facilities, to be identified through the Location coordination process set out in Section 1.8:
- 9.1.1 All bus garages;
 - 9.1.2 One Location on each of the Red, Orange, and Blue Lines;
 - 9.1.3 Four Locations on the Green Line;
 - 9.1.4 Operations Control Center (currently at 45 High Street);
 - 9.1.5 South Station (Commuter Rail); and
 - 9.1.6 North Station (Commuter Rail).
- 9.2 The SI shall ensure that adequate Inspection Devices, spares, consumables, and charging facilities are available at all Locations to meet the Quantity Standards.

10. Recordkeeping and Reporting

The Proposal shall include proposed format and layout for recordkeeping and reporting. [PSR: Proposed format and layout for recordkeeping and reporting]

- 10.1 Daily Work Logs and Real-Time Availability
- 10.1.1 The SI shall provide the MBTA with real-time access to work logs in the PTS for the Supplemental Monitoring Process and preventative maintenance performed, which must include at a minimum:
 - 10.1.1.1 The date and time that work was performed;
 - 10.1.1.2 System Element (including each component) identification, Device number, software component)
 - 10.1.1.3 The inspection or work performed, the results, and the amount of time spent on the task; and
 - 10.1.1.4 Any follow-up action that will be required by the SI.
 - 10.1.2 The SI shall provide the MBTA with real-time access to the PTS to review work logs for corrective maintenance performed, which must include at a minimum:
 - 10.1.2.1 List of each notification or finding received, the source (Automated Monitoring Subsystem, Supplemental Monitoring Process, or notification) and, with the

- date and time of each, the scope (System Element identification, Device number, software component), and the symptoms reported, if any;
- 10.1.2.2 For each notification or finding responded to or repaired, the work performed and the trouble found, if any, and the amount of time spent on the task;
 - 10.1.2.3 For each notification or finding responded to or repaired, any parts used; and
 - 10.1.2.4 For each notification or finding responded to or repaired, whether any follow-up action will be required by the SI, and whether any Handoff will be required.
- 10.1.3 The SI shall provide the MBTA with real-time access to estimated daily Availability statistics for each System Element, including a break down for each Device by type and in the other ways required by the Key Performance Indicators.
- 10.1.4 The SI shall provide the MBTA with real-time access to information through the PTS on Tap retrieval status, including percentage of Readers offline summarized by reason (i.e. undetermined, Vehicle not in Revenue Service, or offline at MBTA request), Readers due for Manual Retrieval of Taps, and Readers manually retrieved, all of which must have supporting detail backup also available through the real-time access.
- 10.1.5 The SI shall provide the MBTA with real-time access to Inspection Device inventory at each Location, including an inventory of spare Inspection Devices, consumables, charging ports, and information on the number of Inspection Devices undergoing repairs.
- 10.1.6 The SI shall provide the MBTA with a daily summary of maintenance work scheduled, performed, and outstanding.
- 10.1.7 The format and layout of the daily work log and the information presented in the portal to the PTS described in this Section 10.1 shall be subject to Design Review as described in Appendix 7. [CDRL: Format and layout of work log conceptual version] [CDRL: Format and layout of work log preliminary version] [CDRL: Format and layout of work log final version]
- [CDRL: Work logs]
- 10.2 Monthly Summary Report
- 10.2.1 As part of each Monthly Performance Report, the SI shall include summaries of the following activities undertaken during the Month addressed by the Monthly Performance Report:
 - 10.2.1.1 Number and types of Supplemental Monitoring Process inspections and preventative maintenance activities, summarized by:
 - 10.2.1.1.1 System Element Grouping;
 - 10.2.1.1.2 Device Variant;
 - 10.2.1.1.3 Location, Vehicle, or other scope; and
 - 10.2.1.1.4 Time spent;
 - 10.2.1.2 Total number of notifications and findings, summarized by:
 - 10.2.1.2.1 Source (Automated Monitoring Subsystem, Supplemental Monitoring Process, or notification);
 - 10.2.1.2.2 System Element Grouping;
 - 10.2.1.2.3 Device Variant;
 - 10.2.1.2.4 Location, Vehicle; and
 - 10.2.1.2.5 Defect type/category (with a list and definitions that must be proposed by the SI);
 - 10.2.1.3 Recurring Problems (including all related analysis described in Section 5.3)
 - 10.2.1.4 Recurring apparent Problems with no trouble found (including all related analysis described in Section 5.5)
 - 10.2.1.5 Repairs and other actions, summarized in hours and cases by:
 - 10.2.1.5.1 Repair type (with a list and definitions that must be proposed by the SI); and

- 10.2.1.5.2 Time spent locating Devices and/or in transit;
- 10.2.1.6 Parts consumption;
- 10.2.1.7 Handoffs to each party summarized by:
 - 10.2.1.7.1 Number opened;
 - 10.2.1.7.2 Number closed; and
 - 10.2.1.7.3 Number still outstanding;
- 10.2.1.8 Percentage of Problems identified by each source (Automated Monitoring Subsystem, Supplemental Monitoring Process, MBTA notification, or other identified source);
- 10.2.1.9 Tap retrieval statistics by Device type, Location or Vehicle, retrieval method (automatic/manual), including average and maximum Tap retrieval durations, lists of repeat Reader outages and top Manual Retrieval Locations and Vehicles;
- 10.2.1.10 Inspection Device consumables usage and equipment repair and replacement needs by Location; and
- 10.2.1.11 Availability statistics of each System Element (including a summary by System Element Grouping and Device Variant and as otherwise required by the Contract Standards).
- 10.2.2 The MBTA may require the SI to change the format of the monthly summary report from time to time and to resubmit the proposed format and layout, but not more frequently than once per year. [CDRL: Updated format and layout of monthly summary report]
- 10.2.3 The Proposal shall include a format and layout for the monthly summary report. [PSR: Proposed format and layout for recordkeeping and reporting]
[CDRL: Monthly summary report]

11. MBTA Right to Inspect

Without limiting any other right or requirement herein, MBTA Persons may at any time throughout the Term, inspect any Location, Vehicle, System Element or Installation.

12. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 4.6. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.11, 4.3 and 4.5. [PSR: Proposer team experience: Management, maintenance and reporting]

APPENDIX 4.7

MERCHANT SERVICES PROVIDER REQUIREMENTS

The SI shall be responsible for selecting and managing Payment Service Providers who will conduct all payment processing functions that occur between the System and the appropriate payment processing networks. This Appendix 4.7 defines the requirements for Payment Service Providers and the responsibilities of the SI in managing the Payment Service Providers.

1. General Requirements

- 1.1 The System and its Sales Channels shall provide the MBTA with secure transaction processing for electronic payments made via all Transaction Channels, including (i) Payment Card Organizations including American Express, Discover, MasterCard and Visa, (ii) electronic debit and prepaid payments, and (iii) ACH payments. Transaction processing includes Authorization, Data capture, clearing, Settlement, and dispute resolution.
- 1.2 The SI shall select and propose one or more Payment Service Providers (PSP or PSPs), including an Acquirer, that will provide acquiring and electronic payment processing services. Each PSP must comply with the availability, accuracy, information security, testing, support, Data retention, scalability, and performance requirements as described in the Technical Requirements, including the requirements of Appendix 3.1.
 - 1.2.1 The Proposal shall identify the Payment Service Providers that will be used, including the Acquirer. [PSR: Payment Service Providers and qualifications]
- 1.3 In respect of the Acquirer:
 - 1.3.1 The MBTA will enter into agreement(s) with the Acquirer and American Express to the extent necessary to establish the MBTA as the “merchant of record” in respect of the Acquirer merchant account(s) described in Section 1.3.2 of this Appendix 4.7, subject to Section 7.3(C) of this Project Agreement.
 - 1.3.2 The SI shall handle all responsibilities as a third party administrator of the MBTA’s Acquirer merchant account(s). The SI shall handle all Settlement activity from the Acquirer and the Settlement of all funds from these accounts must be deposited to bank account(s), which will be jointly owned by the SI and the MBTA, separate from any account established for deposit pursuant to Appendix 4.2 and subject to Section 7.3(A) of this Project Agreement. The SI shall have full responsibility for ensuring any such account remains reconciled with reports received from the Acquirer about deposits made, and the MBTA shall have view-only rights to any such account for occasional audit purposes. Any account established pursuant to this Section 1.3.2 shall be established with a Reserve Bank and shall be subject to the approval of the MBTA, acting reasonably.
 - 1.3.3 The SI shall obtain from the Acquirer access rights, consistent with Good Industry Practice, to the Acquirer’s reporting and query tools, including all appropriate reporting and analysis services.
 - 1.3.4 The SI and the Acquirer shall provide the MBTA with the same access to which the SI is entitled to the Acquirer’s reporting and query tools and read access to the processing environment, along with all reporting and analysis services available from the Acquirer to the SI.

- 1.4 In respect of PSPs other than the Acquirer, including as required by Section 9 of this Appendix 4.7:
- 1.4.1 The SI shall handle all responsibilities as the “merchant of record”, while ensuring it remains clear to each User (including on any financial statement) that the payment transaction was charged to them for an MBTA service;
 - 1.4.2 The SI shall obtain from each PSP (other than the Acquirer) handling any aspect of any Payment Card transactions access rights, consistent with Good Industry Practice, to such PSP’s reporting and query tools, including all appropriate reporting and analysis services; and
 - 1.4.3 For each PSP (other than the Acquirer) handling any aspect of any Payment Card transactions, the SI shall provide the MBTA, or cause each such PSP to provide the MBTA, with the same access to which the SI is entitled to the PSP’s reporting and query tools and read access to the processing environment, along with all reporting and analysis services available from the PSP to the SI.
- 1.5 The SI shall be responsible for ongoing reconciliation of all Settlements and debits from each PSP and the Fare Revenue due to the MBTA must be deposited in accordance with Appendix 4.2, irrespective of the timing and amounts of deposits and withdrawals to the account(s) referenced in Section 1.3.2 of this Appendix 4.7 or any other accounts. If the computations set forth in Appendix 4.2 determine that more Fare Revenues are due than amounts present in the accounts referenced in Section 1.3.2 of this Appendix 4.7 or any other accounts, then the SI shall be responsible, at its own cost and expense, for making all payments necessary to supplement such amounts for purposes of meeting the Fare Revenue deposit requirements of Appendix 4.2. The SI shall keep a balance, at its own cost and expense, in the account(s) referenced in Section 1.3.2 of this Appendix 4.7 sufficient to cover charges and costs from the Acquirer (including interchange), Chargebacks, PAYG Losses, and other losses the SI may incur which are subject to debit from such account(s) in accordance with the policies of the Acquirer or a Payment Card Organization.
- 1.6 The MBTA shall be able to Configure through the SI the merchant descriptor(s) that will appear on Users’ cardholder or bank statements for any payments made to the System, which at a minimum will be distinct by Sales Channel and Location.
- 1.7 The SI shall negotiate with and secure from American Express interchange/discount rates for transaction processing for Payment Card transactions made in the System using American Express Payment Cards which are competitive for transit merchants in Good Industry Practice. The MBTA shall have the right, at any time, to negotiate directly with American Express in respect of interchange/discount rates, and the SI shall provide records of negotiations and supporting Data used in those negotiations and which would reasonably be used in such negotiations. The SI shall also provide, on a commercially reasonable basis, knowledge the SI has about interchange/discount rates paid by the SI’s other transit customers.

2. Experience with Transaction Processing Volumes

- 2.1 The selected PSP(s) shall be capable of processing the MBTA’s payment needs efficiently, accurately and timely and have successfully provided payment services to similar sized public transportation entities.
- 2.1.1 The SI’s Proposal shall demonstrate the PSP’s experience. [PSR: Payment Service Providers and qualifications]
- 2.2 Considering the current volume reflected in the Reference Documents, as well as assumptions about scaling over the Term, additional carriers, and the change in transaction model, the SI must

be able to timely process \$40 million peak single day Payment Card volumes without encountering any restrictions, whether internally enforced or externally enforced, including “Federal Reserve Bank Net Debit Cap” and Payment Card Organization restrictions. The Proposal shall provide documents which support this requirement for the SI and PSPs. [PSR: Payment Service Providers and qualifications]

- 2.3 Considering the current volume reflected in the Reference Documents, as well as assumptions about scaling over the Term, additional carriers, and the change in transaction model, the SI must be able to process \$30 million peak single day ACH debit dollar and \$45 million peak three (3) day rolling ACH debit dollar throughput, without encountering any restrictions, whether internally enforced or externally enforced, including “Federal Reserve Bank Net Debit Cap”. The Proposal shall provide documents which support this requirement for the SI and PSPs. [PSR: Payment Service Providers and qualifications]

3. Payments and Transactions

- 3.1 The System shall implement Payment Card Organization transit transaction rules for the Authorization or Account Verification of the first Tap (including to determine the status of the Account) and the Authorization of the final aggregated spend (including the final amount of all Trips for the period depending on the number of Trips taken, in accordance with Fare Policy). Regardless of the rules and processes associated with current or future transaction models, the Fare Revenue due to MBTA shall be determined using Appendix 4.2.
- 3.2 The SI shall ensure that any PSP obtains Authorizations for all Payment Card transactions.
- 3.3 The SI shall ensure the System is capable of being configured to meet the Payment Industry Standards for the acceptance of Payment Cards to pay for Fares and Products. The SI shall configure the System to take advantage of preferential processes or rates available for transit.

4. Merchant Identification Numbers

- 4.1 The SI shall provide for the timely set up, maintenance and closure of merchant identification numbers (“Merchant IDs” or “MIDs”) and terminal identification numbers (“Terminal IDs” or “TIDs”) which shall include sufficient Data to support reconciliation, and the numbering scheme shall be subject to Design Review in accordance with Appendix 7. [CDRL: Merchant IDs]
- 4.2 The SI shall properly align MBTA’s MIDs and TIDs with the “Service Establishment” (“SE”) numbers assigned by American Express and Discover, respectively, within the PSP’s processing system so that the correct MID and TID is matched to the correct SE number for each American Express and Discover transaction.
- 4.3 The SI shall route all American Express and Discover transactions to those Payment Card Organizations with the correct SE information mapped to the correct MID information.

5. Clearing and Settlement

- 5.1 The SI shall ensure that the PSP generates clearing and Settlement requests, and shall manage responses between the System and the Acquirer. Payment Card Organization and Acquirer rules on clearing, Settlement, debt recovery and other processes must be implemented by the SI.

- 5.2 The SI shall ensure the PSP tracks responses to all Authorization and Settlement requests and tracks and reports each failure and error, including in summarized forms.
- 5.3 The SI shall ensure all transactions are processed and rules developed and implemented for the transaction model if the System or an Acquirer system is down, or responses are delayed.
- 5.4 The SI shall ensure Settlements are submitted seven (7) days per week.
- 5.5 The SI shall ensure Settlement files and responses are stored in an encrypted form for a duration consistent with Appendix 3.1, as allowed by PCI-DSS.

6. Account Updates

For all Payment Cards associated with an Account, the SI shall ensure the PSP can update stored payment account details when the payment information changes, including card expirations, lost or stolen cards, upgrades or portfolio conversions.

7. Match Electronic and Embossed Primary Account Number

- 7.1 The SI shall ensure the PSP matches electronic, mobile and embossed primary account numbers (PANs), where made available, to NFC implementations, subject to Section 13.8 of this Project Agreement in respect of any Change in Payment Industry Standards; this includes a requirement that, subject to Fare Policy and Configuration, the System shall permit a User to access Transportation Services (through an approved Tap) in cases when the User purchases a Pass Product online but uses an NFC Device at the Reader presenting a different PAN than was registered online.
- 7.2 The SI shall ensure the PSP can return all relevant Account Data, including Acquirer tokenized PAN values where applicable, during Authorization response transactions.

8. EMV Transaction Cost-Effectiveness and Correctness

The System shall meet the following requirements:

- 8.1 ISO standard. The SI shall ensure that the System and any PSP (other than the Acquirer) has and uses an ISO 8583 or ISO 20022 certified connection to the Acquirer or a connection of equivalent or superior reliability and capability, if such alternative is approved by the MBTA, acting reasonably. No gateway fees may be incurred by the MBTA. Any gateway fees incurred will be the responsibility of the SI.
- 8.2 Direct connection. At the request of the MBTA, acting reasonably (but without any requirement to issue an MBTA Change Notice), the SI shall use reasonable efforts to investigate the feasibility and cost-effectiveness of direct System-to-issuer connections for the top issuers of Payment Cards used or reasonably expected to be used in the System and shall notify the MBTA in writing of its findings. Without limiting any right of the MBTA in respect of Change Directives or of the SI in respect of SI Change Requests, the SI shall not implement any such connection absent the issuance of an MBTA Change Notice by the MBTA, the preparation of an Implementation Proposal by the SI, and the subsequent execution of a Change Order by the Parties.
- 8.3 Best interchange rates. The SI shall ensure all messages are submitted to the Acquirer in ways that provide the best available interchange rates and minimize downgrades.

- 8.4 Acquirer standards. The SI shall ensure the System meets Acquirer standards for messages. If there are different options for such messages, the SI will review them with the MBTA and the parties will agree on which option to use.
- 8.5 Monitor Acquirer connection. The SI shall ensure the System monitors the handshakes between the System and the Acquirer, including all gateways or other entities, and ensure that all messages/handshakes are being sent, received and processed in a timely and correct manner.
- 8.6 Verification. Reconciliation and verification of Settlement requests and responses to/from the Acquirer, including record counts, amounts, errors, chargebacks, Authorization codes, etc. must be performed. If there are discrepancies, they must be resolved through SI intervention.
- 8.7 Issue resolution. The SI shall identify, respond to, and resolve issues or disputes with payment industry entities. The SI shall bring substantive exceptions and errors to the MBTA's attention on a daily basis.

9. ACH Payment Processing and Exceptions

- 9.1 The SI shall serve as the MBTA's Originating Depository Financial Institution (ODFI) for ACH WEB standard entry class transactions as defined by the National Automated Clearinghouse (NACHA) Operating Regulations.
- 9.2 The SI shall serve as the MBTA's ODFI for ACH TEL standard entry class transactions as defined by the NACHA Operating Regulations.
- 9.3 The SI shall settle ACH WEB and ACH TEL entries on the next Business Day after payment.
- 9.4 The SI shall accept ACH WEB entries for origination through one or more PSP sponsored online payment gateways.
- 9.5 The SI shall accept ACH TEL entries through one or more PSP sponsored IVRU gateways.
- 9.6 In its role as the MBTA's ODFI, the SI shall process all Notifications of Change (NOCs) and Returns in accordance with the NACHA Operating Regulations. The SI shall serve as the MBTA's advocate, protecting the MBTA's rights and fulfilling the MBTA's duties as required under NACHA's Regulations and any relevant federal or Commonwealth statutes and regulations. Subject to Section 1.5 of this Appendix 4.7, the SI shall diligently protect against late returns.
- 9.7 The SI shall make any required Account Data changes based on received NOCs. If the SI fails to make modifications based on received NOCs in a timely manner and any fines or penalties are assessed by NACHA, SI shall pay such fines or penalties.
- 9.8 The SI shall fully research any ACH entry returned as unauthorized and re-present for payment each entry deemed by the SI, as the ODFI, to have been properly authorized.
- 9.9 The SI shall re-present all entries returned for insufficient funds a minimum of one time and multiple times if so instructed by the MBTA.
- 9.10 The SI shall provide written notice to the MBTA of any transaction that results in a financial adjustment to any bank account, which notice shall be provided on the same day of the occurrence and provide a full explanation of the transaction and the financial adjustment.

10. Dispute Resolution

- 10.1 The SI shall, directly and by causing PSP(s) to perform, manage the User dispute resolution process on behalf of MBTA, including responding to retrievals, Chargebacks, and claims for unauthorized ACH debits (eChecks).
- 10.2 In respect of any ACH dispute, the MBTA will only accept financial responsibility when the dispute is a result of MBTA Service Failure and only by way of a Direct Refund issued in accordance with all Contract Standards; provided that, the extent of the MBTA's financial responsibility under such circumstances shall be limited to the amount required to be paid back to the User as a direct result of the MBTA Service Failure.
- 10.3 The SI shall use all flexibility afforded to merchants by Payment Card Organization rules to fully dispute each Chargeback, provided that:
- 10.3.1 The SI may elect, at its discretion, not to dispute any Chargeback; the SI thereby agrees not to include that Chargeback in any Eligible Subtractions Report (for the avoidance of doubt, this may include Chargebacks which result from a failure of the System to comply with the Contract Standards);
 - 10.3.2 The SI shall not be obligated to dispute any Chargeback resulting from an MBTA Service Failure, unless a Direct Refund was issued in respect of the User transaction to which the Chargeback relates;
 - 10.3.3 The SI shall not be obligated to dispute any Chargeback for a monetary amount less than \$5.00 (five dollars), Index Linked, for which the Chargeback reason (based on the classification or coding scheme used by the applicable Payment Card Organization) is either (i) potential fraud by a party other than any SI Person or (ii) that merchandise or services were not as described or not received. The Parties may, by mutual written agreement, choose a different threshold, or a dynamic threshold based on risk factors, for purposes of the foregoing.
- 10.4 For any Chargeback which Section 10.3 of this Appendix 4.7 requires that the SI dispute:
- 10.4.1 The SI shall review and respond to any such Chargeback within the time limits defined by Payment Card Organization rules in which actions can be taken to remedy or resolve a Chargeback or User dispute;
 - 10.4.2 The SI shall provide records to dispute transactions, including receipts, evidence of related Direct Refunds, transaction data and all compelling evidence for such a Chargeback or User dispute as would be expected under Good Industry Practice;
 - 10.4.3 The SI shall respond to and fulfill all retrieval requests for documents, images, or receipts in respect of any Chargeback or User dispute of a transaction; and
 - 10.4.4 The SI shall take all necessary follow-up actions in respect of the dispute to maximize opportunities to collect, in accordance with Payment Card Organization rules.
- 10.5 The SI shall maintain records to monitor Chargebacks and User disputes by reason (as understood by reference to Payment Card Organization and NACHA rules), by issuer, by proportion of Fare Revenue by Transaction Channel, and with statistics about dispute and collection success rates. The SI shall prepare and use the foregoing analysis on an ongoing basis to train Personnel and modify and configure the System to adapt to Payment Card Organization and NACHA transaction acceptance policies and procedures, so as to eliminate recurrence of Chargebacks and User disputes that could have been prevented or substantially mitigated.

10.6 Without limiting any obligation of the SI hereunder, the MBTA, at its discretion, shall be entitled to dispute Chargebacks itself; in such event, the SI shall cooperate and fully support the investigation, providing MBTA access to all supporting records which the SI is required by the Contract Standards to maintain in respect of Payment Card transactions, and all Acquirer tools and services which are available to the SI in respect of chargebacks. The MBTA shall get the full benefit of monetary amounts recovered based on Chargebacks for which the MBTA initiates the dispute, and such monetary amounts shall not be eligible for inclusion in the Eligible Subtractions from Fare Revenue. The SI, directly and by causing the Acquirer to perform, shall provide such monetary amounts recovered to the MBTA in a manner consistent with the method used for deposit of Fare Revenues provided in Appendix 4.2.

11. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 4.7. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach required herein. The narrative shall specifically address how the Proposer, if the selected SI, would leverage that experience to optimize the services used within the Allowable AP Transaction Fees, including describing the Proposer's team makeup, negotiation methods, market leadership, optimal use of technology within Payment Industry Standards, and participation in development of standards and pricing models for support of the Fare Card in mobile wallets. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 3.6, 4.1 and 4.2. [PSR: Proposer team experience: Revenue collection and remittance]

APPENDIX 5

MILESTONE CONDITIONS

Table of Contents

Appendix 5.1 - Special Requirements During Installation and the Transition Period

1. Support.....1

2. Monitoring Quantities and Capacity2

3. Addressing Usability Issues2

4. Reporting on Adoption Rates.....3

5. Campaign Support3

6. Experience.....3

Appendix 5.2 - Criteria for Installation

1. Site Preparation.....1

2. Early Installation of System Elements Pursuant to Gate Option 42

3. Installation of Devices3

4. Installed Devices and System Elements.....5

5. Removal of AFC 1.0 FVMs.....5

Appendix 5.3 - Pilots

1. Design of the Pilots.....1

2. Requirements Applicable to Both Pilots.....2

3. Support.....3

4. Criteria for Commencing and Completing each Pilot.....4

5. Pilot Standards7

6. Failure to Meet Criteria for Completion of Pilots.....8

7. Experience.....9

Appendix 5.4 - Criteria for Revenue Service Commencement

1. General Requirements.....1

2. Notice.....3

Appendix 5.5 - Criteria for Transition Period Completion

1. Acceptance of Legacy Media.....1

2. Criteria for Transition Period Completion1

3. Notice.....2

Appendix 5.6 - Criteria for Full Service Commencement

1. Criteria for Full Service Commencement1

2. Notice.....2

APPENDIX 5.1

SPECIAL REQUIREMENTS DURING INSTALLATION AND THE TRANSITION PERIOD

This Appendix 5.1 describes requirements that apply when changes to the System and/or the Existing System are visible to the public, including during Installation, Pilots and the Transition Period.

1. Support

The SI shall provide additional support and service levels to the MBTA and in operation of the System in order to ensure excellent customer experience and to coordinate with the MBTA to ensure there is no interruption to daily MBTA operations and revenue collection.

1.1 Addressing Accessibility Issues

The Accessibility specialist described in Appendix 2.9 shall be available throughout Installation for site visits and to liaise between the MBTA and the SI regarding Accessibility issues. The SI shall report all Accessibility issues to the MBTA, resolve all Accessibility issues relating to the System and assist the MBTA in resolving existing Accessibility issues at the Locations in accordance with Appendix 2.9.

1.2 Monitoring User Complaints

The SI shall monitor all User complaints related to the System, including those reported through MBTA customer service channels (including website comment form, phone and email), discussed on social media and blogs, reported in the news, and observed by MBTA staff.

1.2.1 The SI shall track all User complaints throughout the Installation, Transition Period and through the Full Service Commencement Date.

1.2.2 Complaints shall be classified by:

1.2.2.1 The extent to which the complaint relates to System compliance with the Contract Standards, including identification of the part of the System referenced in the complaint and whether such part is fully compliant, partially compliant or non-compliant with the Contract Standards;

1.2.2.2 Whether the User feedback is in agreement with or contradictory to the objectives and requirements established by the Contract Standards;

1.2.2.3 Impact described as high medium or low, depending on how widespread and the number of Users affected;

1.2.2.4 Associated risk, including safety, revenue collection, service, public perception, and violation of Applicable Law;

1.2.2.5 Priority level as high, medium or low based on impact and risk; and

1.2.2.6 The number of similar or identical complaints.

1.2.3 The SI shall report on User complaints through the Project status dashboard described in Appendix 2.11 from the time any Installation starts until the Full Service Commencement Date. [CDRL: User complaint report]

1.2.4 The SI shall assist the MBTA in responding to User complaints, via updates to the MBTA website, press releases, interviews, social media posts, letters, emails, phone calls or other means of customer communication. The SI shall create draft responses regarding significant User complaints for MBTA approval.

- 1.3 The SI's Proposal shall include a description of the SI's approach to providing the support services described above, including the approach to addressing Accessibility issues and monitoring User complaints. [PSR: Approach to support during Installation and the Transition Period]

2. Monitoring Quantities and Capacity

The SI shall continually monitor System adoption levels and coordinate with the MBTA to ensure adequate capacity exists for Users at all Locations and on all Vehicles throughout Installation.

- 2.1 The number of Gates shall at all times, meet egress and Accessibility standards as described in Appendix 2.9, 2.10 and 2.13.
- 2.2 The SI shall monitor usage of Customer-Facing Devices to ensure that the Queuing Principle of the Quantity Standards (as described in Appendix 2.10) is being met.
- 2.3 The SI shall monitor Point of Sale Locations, update the inventory of Point of Sale Locations and gradually increase the number of Point of Sale Locations throughout Installation in order to meet the Coverage Principle of the Quantity Standards (as described in Appendix 2.10) pursuant to the Criteria for Revenue Service Commencement and the Criteria for Full Service Commencement.
- 2.4 The SI shall monitor System performance as usage increases to ensure that the System can handle the capacity.

3. Addressing Usability Issues

Without limiting the SI's obligations hereunder in respect of compliance with the Technical Requirements, the SI shall analyze usability issues observed and reported and recommend improvements where appropriate. For each recommended improvement based on reported issues, the SI shall develop a usability improvement plan.

- 3.1 Analysis shall include an explanation of the User impact and consideration for what could be done differently, including whether the improvement would require any change to the Technical Requirements.
- 3.2 Issues shall include those reported through MBTA customer service channels (including website comment form, phone and email), discussed on social media and blogs, reported in the news, and observed by MBTA staff.
- 3.3 Proposed improvements shall utilize the SI's industry expertise, Good Industry Practice, and draw on best practices from other transit systems.
- 3.4 Proposed improvements shall focus on changes that can be implemented within the System's current capability.
- 3.5 Any proposed improvements that might result in a change to the Technical Requirements shall be identified as such and include preliminary cost and time estimates.
- 3.6 The SI shall seek approval from the MBTA before implementing any changes recommended in a usability improvement plan. [CDRL: Usability improvement plan]

4. Reporting on Adoption Rates

During the Transition Period, the SI shall provide weekly reports on User adoption as part of the Project status dashboard described in Appendix 2.11. The reports shall provide the following, at a minimum:

- 4.1 Number of AFC 1.0 balances converted to Media.
- 4.2 Number of new User Accounts, broken down by Registered Accounts and Unregistered Accounts.
- 4.3 Number of new pieces of Media, broken down by type.
- 4.4 Number of Account Balance transfers from a Temporary Fare Card to a Standard Fare Card and Mobile Fare Card.
- 4.5 Number of AFC 1.0 Gates still in use, with a breakdown of the number of AFC 1.0 Gates in use by type and by Location.

[CDRL: Adoption rate report]

5. Campaign Support

MBTA Persons will lead a transition campaign which will include a comprehensive marketing and communication program and may include print, static, digital, radio, television, etc. to provide Users with information about the Project. The SI shall support these campaign efforts by:

- 5.1 Providing high resolution stock photos of Customer-Facing Devices and detailed photos of their operable parts for use in MBTA marketing materials.
- 5.2 Supplying screenshots of Customer-Facing Device, System Website and Mobile Fare Card screens showing various messages and stages of a transaction.
- 5.3 Offering advice based on the SI's experience and Good Industry Practice for driving User awareness, understanding, acceptance, and use of the System.
- 5.4 On request, writing copy that describes User transactions with Customer-Facing Devices and Sales Channels.
- 5.5 On request, reviewing marketing materials to confirm that they align with System functionality and the SI's advice as described in Section 5.3.

[CDRL: Campaign support]

6. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 5.1. The narrative should identify at least one reference project where (i) the Proposer or a member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach described herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.13, 2.14 and 5. [PSR: Proposer team experience: Implementation, expansion, DB oversight and testing]

APPENDIX 5.2

CRITERIA FOR INSTALLATION

The SI shall not install any Device until it has demonstrated to the MBTA that all conditions identified in this Project Agreement that are required to be satisfied prior to the Installation Commencement Date, including the criteria set forth in Section 3 of this Appendix 5.2 (“Criteria for Installation”), have been satisfied by the SI. The SI may make physical site preparations to Locations and Vehicles provided that the criteria for site preparation described in this Appendix 5.2 have been met.

Installation that involves any DB Installation Work may not begin (and the Installation Commencement Date milestone cannot be achieved) until 180 days after the acceptance of the Complete DB Plans and Specifications by the SI in accordance with Appendix 2.13.

1. Site Preparation

1.1 Criteria for Commencement of Site Preparation

Under no circumstances shall site preparation begin in respect of any Location or Vehicle prior to achieving Financial Close. The SI may proceed with site preparations in respect of Locations and Vehicles prior to meeting all of the Criteria for Installation provided that the following criteria have been met:

- 1.1.1 The MBTA has accepted the SI’s update to the phase-in plan (defined in Appendix 2.13), including details of the work to be completed during site preparation, pursuant to Appendix 7 (MBTA Review Procedures). [CDRL: Updated Phase-In Plan]
- 1.1.2 The SI shall prepare a presentation for the MBTA to demonstrate to the reasonable satisfaction of the MBTA that the AFC 1.0 Equipment to be removed or re-used has been carefully considered by the SI and, especially in the case of re-use of gates, exhaustively tested by the SI to ensure that legacy system functionality will not be degraded by the SI’s re-use of that equipment. [CDRL: Presentation of Phase-In Plan]
- 1.1.3 The SI shall prepare, and provide the MBTA with not less than 30 days to review, implementation plans, including the installation and interface plans described in Appendix 2.12 and 2.14, and their accompanying quality assurance plans and safety certification plans (as described in Appendix 2.11), and the MBTA shall have accepted such plans pursuant to Appendix 7 (MBTA Review Procedures).
- 1.1.4 Prior to any DB Installation Work, the SI shall have provided training to the DB Entity, as described in Appendix 2.11.
- 1.1.5 The SI shall prepare, and provide the MBTA with not less than 30 days to review, updated contingency plans and risk assessments (as described in Appendix 3.10), and the MBTA shall have accepted such plans and assessments pursuant to Appendix 7 (MBTA Review Procedures).
- 1.1.6 The SI shall provide the MBTA with 30 days’ advance written notice of the expected start date of site preparation. [CDRL: Notice of site preparation]
- 1.1.7 The SI shall have received a Notice to Proceed with site preparation from the MBTA, confirming satisfaction of the foregoing criteria. The MBTA shall issue such Notice to Proceed upon satisfaction of such criteria by the SI.

1.2 Work Permitted During Site Preparation

- 1.2.1 Site preparation work may include DB Installation Work and/or SI Installation Work.

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- 1.2.2 Site preparation work shall minimize interruption to daily MBTA operations and revenue collection to the maximum extent possible, with all disruptions to be approved in advance by the MBTA (acting reasonably).
 - 1.2.2.1 Disruptions include:
 - 1.2.2.1.1 Physical activities that interfere with passenger flows;
 - 1.2.2.1.2 Activities in adjacent areas which create objectionable dust, noise, or fumes in public areas; and
 - 1.2.2.1.3 Potential fouling of the right-of-way.
 - 1.2.2.2 The SI's Project Management Plan (described in Appendix 2.11) shall describe how it will minimize interruption to daily MBTA operations and revenue throughout Installation. [CDRL: Approach to minimizing interruption to MBTA operations and revenue during Installation]
 - 1.2.3 Site preparation work shall not cause or have the potential to cause a safety or security hazard.
 - 1.2.4 Site preparation work shall minimize visibility of the work to the general public.
 - 1.2.5 Site preparation work shall not remove any AFC 1.0 Equipment from Revenue Service.
 - 1.2.6 Site preparation work shall not include the Installation of any Customer-Facing Devices.
 - 1.2.7 Pre-installation of wiring is permitted provided that the SI ensures that there is no public access to any wiring. The condition of the Location and/or Vehicle, including all interior panels and fixings, must be kept in a safe, operable condition. The SI shall ensure all temporary modifications/installations are tamperproof and appropriately secured.
 - 1.2.8 Proposed site preparation is subject to MBTA approval and should be outlined in the installation and interface plans described in Appendix 2.12 and 2.14.
 - 1.2.9 The SI's Proposal shall include a description of any planned site preparation work in the preliminary installation and interface plan described in Appendix 2.13 and the approach to Vehicle installation Submittal described in 2.12. [PSR: Installation and interface plan (preliminary)] [PSR: Approach to Vehicles installation]
- 1.3 The SI shall (directly and by reflecting applicable requirements in the DB Plans and Specifications) make any modifications to site preparation work that are required to successfully complete the Installation and address any changes resulting from the Design Review (as described in Appendix 7) and completion of testing protocols (as described in Appendix 2.16).

2. Early Installation of System Elements Pursuant to Gate Option 4

To the extent that Gate Option 4 is proposed for use, the SI may elect to perform first stage work (described in Appendix 2.3) prior to the Installation Commencement Date provided that:

- 2.1 The SI has completed Design Review and user testing for Gate Option 4 first stage work.
- 2.2 The SI has demonstrated that any Readers to be installed are compliant with the Reader Standards described in Appendix 3.2 by either:
 - 2.2.1 Providing evidence of existing certification of the Readers to be installed and providing a statement from the Systems Integrator Representative certifying that no substantial changes have been made since such certification was granted; or
 - 2.2.2 Completing all testing and certification required for Readers under Appendix 3.2.
- 2.3 The SI has demonstrated and certified to the MBTA that physical characteristics (i.e. hardware) of System Elements to be installed are fully compliant with the Contract Standards, using the testing requirements specified in Appendix 2.16. The SI is not required to demonstrate full compliance for Software prior to the early Installation of System Elements pursuant to Gate Option 4.

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- 2.4 The SI shall, directly and by including applicable requirements in the DB Plans and Specifications, provide a Gate Transition Demonstration of the Gate Option 4 first stage work as described in Appendix 2.16.
 - 2.5 All later stage work shall undergo Design Review, user testing, functional and performance testing and Gate Transition Demonstration prior to any Installation not included in the first stage work.
 - 2.6 The SI shall provide a Device safety test report for each Variant of each Device being installed thirty (30) days prior to installation of such Device, as described in Appendix 2.3.

3. Installation of Devices

Prior to installing any Customer-Facing Device, the SI shall satisfy all Criteria for Installation, including (i) criteria for site preparation described in Section 1 of this Appendix 5.2, (ii) to the extent that Gate Option 4 is proposed for use, criteria for early Installation of System Elements pursuant to Gate Option 4 described in Section 2 of this Appendix 5.2; and (iii) criteria for Installation of Devices described in this Section 3. The Installation Commencement Date milestone will be achieved when all of these requirements have been met.

- 3.1 The SI shall rectify any area of non-compliance resulting from site preparation work or early Installation of System Elements pursuant to Gate Option 4.
- 3.2 Complete Design Review of Customer-Facing Devices
The Design Review process for Customer-Facing Devices is described further in Appendices 2.3 and 7.
- 3.3 Demonstrate Compliance for System Elements to Be Installed
 - 3.3.1 The SI shall demonstrate and certify to the MBTA that physical characteristics (i.e. hardware) of System Elements to be installed are fully compliant with the Contract Standards, using the testing requirements specified in Appendix 2.16. The SI is not required to demonstrate full compliance for Software prior to the Installation Commencement Date.
 - 3.3.2 The SI shall provide the safety test reports for all Customer-Facing Devices no later than thirty (30) days prior to the Installation Commencement Date, as described in Appendix 2.3. To the extent that the SI re-uses AFC 1.0 Gates, the SI shall provide safety test reports for all components added to Gates and shall support the MBTA in getting the modified AFC 1.0 Gate tested, as further described in Appendix 2.3.
 - 3.3.3 The SI shall provide certification of Level 1 and 2 Contactless EMV standards as described in Appendix 3.2.
 - 3.3.4 The SI shall provide copies of all ROCs and Attestations of Compliance, as described in Appendix 3.1.
 - 3.3.5 The SI shall achieve certification to the LTE bands 2, 4, and 13 as described in Appendix 2.5.
 - 3.3.6 The SI shall provide an updated risk assessment no later than thirty (30) days prior to the Installation Commencement Date, as described in Appendix 3.1.
 - 3.3.7 The SI shall provide an updated contingency plan no later than thirty (30) days prior to the Installation Commencement Date, as described in Appendix 3.1.
 - 3.3.8 The Final Design Review for the Computation Report shall have been completed, as described in Appendix 4.2.
 - 3.3.9 The SI shall provide the Compliance Matrix (described in Appendix 2.16) as Documentation showing how compliance was demonstrated. The Compliance Matrix shall indicate the requirements for which compliance will be demonstrated after installation.

- 3.3.10 Subject to Section 3.3.11, the System will not be considered fully compliant pursuant to this Section 3.3 until the MBTA accepts the outcomes of all tests and approves the Compliance Matrix pursuant to Appendix 7 (MBTA Review Procedures).
- 3.3.11 The SI may submit a written request for approval from the MBTA to begin Installation prior to demonstrating full compliance with System Elements to be installed, subject to the terms and conditions of this Section 3.3.11. In order obtain any such approval, the SI must request and receive a waiver in writing from the MBTA. The SI's request shall include:
- 3.3.11.1 An explanation of why the waiver is being requested;
 - 3.3.11.2 A Punch List of System Elements not compliant with the Contract Standards;
 - 3.3.11.3 For each item on the Punch List, an explanation of how and when compliance will be demonstrated;
 - 3.3.11.4 A statement confirming that all safety and information security requirements established by the Contract Standards have been met;
 - 3.3.11.5 An explanation of how the items on the Punch List will not negatively impact MBTA operations or revenue collection; and
 - 3.3.11.6 A commitment from the SI to resolve all areas of non-compliance before commencing Pilot Phase 2.

[CDRL: Request for waiver of Criteria for Installation]

The MBTA, acting reasonably, will consider any such approval request in accordance with Appendix 7 (MBTA Review Procedures). Without limiting any right of the MBTA hereunder, the MBTA shall have no obligation to grant any such approval if the SI's request does not comply with the foregoing requirements or if there is any failure of compliance with any safety or information security requirements established by the Contract Standards or if the MBTA reasonably believes that the items on the Punch List will negatively impact MBTA operations or revenue collection.

- 3.4 Provide the Gate Transition Demonstration
To the extent that Gate Options 1, 2, or 3 are proposed for use, the SI shall, directly and by including applicable requirements in the DB Plans and Specifications, provide a Gate Transition Demonstration as described in Appendix 2.16, including, where applicable, first and Second Stage Work.
- 3.5 Show Evidence of Supply Chain
The SI shall demonstrate that it has adequate manufacturing and supply chain capacity as described in Appendix 4.4 to complete each proposed iteration of Installation. [CDRL: Demonstration of manufacturing and supply chain capacity]
- 3.6 Deliver Source Code
The SI shall deliver Source Code and Documentation for the System Website (as described in Appendix 3.8) and, if the SI develops a mobile application, the Fare Card Mobile Application (as described in Appendix 2.6).
- 3.7 Deliver Plans and Documentation
The SI shall deliver all Submittals (CDRLs) specified in this Project Agreement and master Submittals list (Appendix 2.11 – Attachment 1) as a requirement or condition precedent for the Installation Commencement Date.

3.8 Make Available the Model Office

The SI shall have made the Model Office available in the Proposed Configuration Mode as described in Appendix 2.4 for, at a minimum, thirty (30) days prior to the Installation Commencement Date.

3.9 Provide Notice

The SI shall provide the MBTA with thirty (30) days' advance written notice (as described in Section 6 of the Project Agreement) of the expected date of satisfaction of all Criteria for Installation. [CDRL: Notice of expected date of satisfaction of Milestone conditions]

4. Installed Devices and System Elements

Prior to use in Revenue Service, all installed Devices and System Elements shall remain out of service to the public and where the Device or System Element is visible to the general public, messaging on the Device shall indicate that it is out of service. The SI shall propose such messaging for MBTA approval.

5. Removal of AFC 1.0 FVMs

During Installation, the SI shall fully account for the Transition Period in applying a phased approach to the removal of AFC 1.0 FVMs, and shall ensure that adequate capacity is maintained at all times in accordance with the adoption rate of Media.

APPENDIX 5.3

PILOTS

The SI shall perform and implement two (2) Pilots of the System, which will include Installations and activations of System Elements in MBTA Revenue Service.

1. Design of the Pilots

1.1 Participants

- 1.1.1 Pilot participants shall include MBTA customers representative of the larger population of customers in their racial, geographic, socio-economic, education, age, language and ability diversity. Participants should also vary in their use of Transportation Services, including Modes, routes, Reduced Fare Group entitlement, travel times and frequency.
- 1.1.2 In both Pilots, MBTA employees shall be participants.
- 1.1.3 The SI shall coordinate the enrollment and participation of participants in both Pilots.
- 1.1.4 The SI shall develop a Pilot participant recruitment specification, including a description of the registration process, screening questions and selection criteria for each Pilot. The SI shall propose the number of participants for each Pilot based on the SI's experience in coordinating such a pilot in a transit system. [CDRL: Pilot participant recruitment specification]
- 1.1.5 For Pilot Phase 1, the MBTA will provide a list of participants to the SI.
- 1.1.6 For Pilot Phase 2, the SI shall support a web registration process open to all Users to volunteer to participate in the Pilot. The SI shall nominate a list of selected participants, including corresponding demographic and Transportation Service use data described in Section 1.1.1 of this Appendix 5.3, for MBTA review. [CDRL: List of participants for Pilot Phase 2]
- 1.1.7 Pilot Phase 2 shall include Group program participants, including at least one post-paid Group selected by the MBTA and one pre-paid Group.
- 1.1.8 The MBTA reserves the right to nominate and make final determinations concerning Pilot participants.
- 1.1.9 The participants of Pilot Phase 1 shall be included in Pilot Phase 2 at their election.

1.2 Locations

- 1.2.1 The specific geographic deployment of Devices and POS Locations for the Pilots shall be coordinated to ensure the System can be used as comprehensively as possible by the Pilot participants (for example, for each participant's trip both to and from work) and that the Pilot represents real-world use cases (as described in Appendix 2.16). For example, both indoor and outdoor Locations for Fare Vending Machines shall be included in the geographic deployment.
 - 1.2.1.1 The SI shall provide details of the selected Pilot area, including the number of Devices and POS Locations proposed for use in the each Pilot, in accordance with the requirements of this Section 1.2.1. [CDRL: Pilot area]
- 1.2.2 The MBTA reserves the right to approve the Pilot area.

1.3 Design Review

Pilot plans are subject to Design Review as described in Appendix 7.

- 1.3.1 The Proposal shall address the Technical Requirements set forth in this Appendix 5.3 in a manner that is comprehensive, responsive to the Project objectives, credible, and

compatible with the Proposer's proposed technical solution. The Proposal shall include a general explanation which describes how the Proposer's approach satisfies the objectives described above and which demonstrates a thorough understanding of the MBTA's needs. The Pilots general approach Submittal shall be used for Conceptual Design Review.

[PSR: Pilots general approach]

- 1.3.2 During Preliminary Design Review, the SI shall provide:
 - 1.3.2.1 The proposed Pilot area described in Section 1.2.1 of this Appendix 5.3.
 - 1.3.2.2 The Pilot participant recruitment specification and Pilot area Submittals described in this Section 1.
 - 1.3.2.3 A plan for measuring and reporting on Device Availability, accuracy and functionality during Pilots as described in Section 2.2 of this Appendix 5.3.
- 1.3.3 During the Final Design Review, the SI shall provide detailed plans for each phase of the Pilot, including:
 - 1.3.3.1 Updates to the Submittals described in Section 1.3.2 of this Appendix 5.3 based on feedback from the Preliminary Design Review.
 - 1.3.3.2 A prototype or beta version of the Pilot registration process.

[CDRL: Pilot plans final design]

2. Requirements Applicable to Both Pilots

- 2.1 The Pilots shall be conducted to verify System operation and functionality in the field in accordance with the Technical Requirements. Each Pilot shall include all System functionality, except where specifically exempted, notwithstanding that only a subset of Devices will be installed.
- 2.2 The SI shall track the Availability, accuracy and functionality of all Devices during the Pilot through the Automated Monitoring Subsystem, and shall include in that tracking (without limitation) all MBTA-reported deviation or exceptions from the requirements.
 - 2.2.1 The SI shall explain how Availability, accuracy and functionality will be measured and reported on during the Pilots. [CDRL: Plan for measuring and reporting on Device Availability, accuracy and functionality during Pilots]
- 2.3 If the SI proposed to use a Retail Reload Locations to meet Quantity Standards, Retail Reload Locations shall be capable of enabling and reloading Media during the Pilots.
 - 2.3.1 Fare Cards shall not be available to Customers in Retail Reload Locations until after successful completion of Pilot Phase 2. After MBTA-agreed completion of Pilot Phase 2, the SI shall be permitted to begin distributing Fare Cards in Retail Reload Locations.
- 2.4 During the Pilots, the System Elements required in this Appendix 5.3 must be fully available for Pilot participants, but only Configurably available to other Users. For example, Validators shall not charge anyone other than a Pilot participant.
- 2.5 The System shall be capable of Configurably limiting the number of participants in each Pilot.
- 2.6 The SI shall provide the MBTA with Fare Cards for distribution to Pilot participants and shall provide a process for the MBTA to Enable these Fare Cards.
- 2.7 The SI shall provide a method for Pilot participants to opt in to the Pilot and create an Account. Both Registered Accounts and Unregistered Accounts shall be supported for Pilot participants.
- 2.8 The SI shall provide a mechanism for the MBTA to Configurably subsidize Pilot participant Accounts.

- 2.9 Each Pilot adds participants and System Elements. The SI may not remove a participant from the Pilots unless the MBTA or the participant so requests. The SI may not remove System Elements from the Pilot unless the MBTA so requests.
- 2.10 The System shall support the use of System Elements in MBTA Revenue Service for Pilot participants in between Pilot phases and in between the completion of the Pilots and the Revenue Service Commencement Date.
- 2.11 The System shall not allow Users who are not Pilot participants to complete transactions, including Taps and purchases, with System Elements in MBTA Revenue Service.
- 2.12 If a Fare Card Mobile Application is developed to meet Mobile Fare Card requirements, the SI shall deliver the Fare Card Mobile Application using the pre-release distribution method identified in the Submittal required by Appendix 2.6.
 - 2.12.1 The Fare Card Mobile Application shall not be publicly available in the app stores until after successful completion of Pilot Phase 2. After MBTA-agreed completion of Pilot Phase 2, the SI shall be permitted to begin distributing the Fare Card Mobile Application via app stores.
- 2.13 During the Pilots, the number of Gates shall at all times, meet egress and Accessibility standards as described in Appendix 2.9 and 2.13.
- 2.14 To the extent Appendix 3.3 requires Readers to accept AFC 1.0 Media during the Pilots and the Transition Period, any Reader used in any Pilot shall comply with all requirements in respect of acceptance of AFC 1.0 Media during the Pilots as would otherwise apply during the Transition Period.
- 2.15 Prior to the start of each Pilot, the SI shall comply with the requirements for installed Devices and System Elements described in Appendix 5.2 and shall rectify any areas of non-compliance resulting from Installation work.
- 2.16 The DB Completion Date in respect of Pilot Phase 1 shall have occurred prior to the start of Pilot Phase 1, and the DB Completion Date in respect of Pilot Phase 2 shall have occurred prior to the start of Pilot Phase 2.

3. Support

- 3.1 The SI shall provide on-site and in-person support on a full-time basis during all Pilots, which support shall cover each major area of specialization of the System (hardware, software, networks, installations, etc.).
- 3.2 The SI shall record, track, monitor and report on all issues related to the System during the Pilots, including compliance with all requirements specified in Appendix 5.1.
- 3.3 The SI shall investigate all issues and Defects which occur during the Pilots and comply with all requirements specified in Appendix 2.16.
- 3.4 The SI shall analyze usability issues observed and reported during each Pilot in accordance with Appendix 5.1 and provide usability improvement plans for each Pilot.

4. Criteria for Commencing and Completing each Pilot

4.1 Pilot Phase 1

The Users for Pilot Phase 1 shall be selected in accordance with Section 1.1 of this Appendix 5.3.

4.1.1 Criteria for Commencement

- 4.1.1.1 The SI shall demonstrate compliance for all functionality visible to Customers.
- 4.1.1.2 Installation of at least one (1) Vehicle Validator at each door of either (a) all Green Line Vehicles or (b) all Vehicles based at one or more of the following bus garages: Cabot, Albany, Charlestown, Arborway, or Southampton.
- 4.1.1.3 Installation of Station Validators at all Stations on one (1) Commuter Rail line (excluding the Fairmount line) in full compliance with the Quantity Standards with respect to those Stations.
- 4.1.1.4 Installation of at least one (1) Accessible Gate in each Fare Array at the Stations which serve as the most common transfer locations for Users of the Transportation Network served by the Vehicles and Stations selected for this Pilot, and in any case no fewer than six (6) Accessible Gates overall. Gates in addition to the required Accessible Gates may be installed provided an Accessible Gate is installed in each specified Fare Array.
 - 4.1.1.4.1 If the SI elects to use Gate Option 2 or Gate Option 3, Gates compliant with first stage installation requirements (as described in Appendix 2.3) may be counted toward the number of Gates required for the Pilot.
 - 4.1.1.4.2 If the SI elects to use Gate Option 4, AFC 1.0 Gates compliant with first stage installation requirements (as described in Appendix 2.3) may be counted toward the number of Gates required for the Pilot.
- 4.1.1.5 Availability of Point of Sale Locations compliant with the Quantity Standards in all areas where the Transportation Network served by the Vehicles and Stations selected for this Pilot and, in any case including:
 - 4.1.1.5.1 At least one (1) Fare Vending Machine near each Fare Array at each Station equipped with an Accessible Gate as part of this Pilot.
 - 4.1.1.5.2 If the SI elects to use Retail Reload Locations to meet POS Quantity Standards, at least five (5) Retail Reload Locations.
 - 4.1.1.5.3 Installation of at least five (5) Fare Vending Machines in Locations other than Stations. Such Locations may not include the Model Office or any prototype or demonstration sites.
- 4.1.1.6 Availability of at least fifteen (15) Inspection Devices.
- 4.1.1.7 The DB Completion Date in respect of Pilot Phase 1 has occurred and all Devices required for Pilot Phase 1 are installed, ready to be placed into Revenue Service and able (as applicable) to Enable Fare Cards, reload Accounts and perform Inspection and Validation.
- 4.1.1.8 The SI shall complete the development, implementation and testing of all External Interfaces (except for the inspection violation and reduced fare eligibility External Interfaces) in such time as to allow the MBTA thirty (30) days of use of the delivered proposed production versions of those External Interfaces prior to the Pilots, as described in Appendix 3.10.
- 4.1.1.9 All Account management functionality is available through the System Website, Customer Support System and Mobile Fare Card, with the exception of Group Account management functionality.
- 4.1.1.10 The inventory of POS locations has been delivered, as described in Appendix 2.10.

- 4.1.1.11 The self-monitoring and reconciliation program has been implemented for thirty (30) days, as described in Appendix 4.5.
- 4.1.1.12 A training program has been delivered for System Elements in use during the Pilots to all Personnel who will interact with the System during the Pilots, as described in Appendix 2.11.
- 4.1.1.13 The SOC 2 report and ISO certification report have been delivered, as described in Appendix 3.1.
- 4.1.1.14 The Final Design Review of the balance conversion plan has been completed, as described in Appendix 4.4.
- 4.1.1.15 The SI shall deliver all Submittals specified in the Technical Requirements as being due prior to Pilots.
- 4.1.1.16 If a waiver was granted for Installation, all items in the Punch List must be completed.
- 4.1.2 Duration and Measurement
The SI shall measure and record the Availability of the Devices and other parts of the System that have been included in Pilot Phase 1 over a thirty (30)-day consecutive period. The Availability shall be measured in respect of the Pilot standards set out in Section 5 of this Appendix 5.3.
- 4.1.3 Criteria for Completion
 - 4.1.3.1 The System must operate successfully for thirty (30) consecutive days meeting the standards of success defined for this Pilot in Section 5 of this Appendix 5.3.
 - 4.1.3.2 The SI shall submit a report on the results of Pilot Phase 1 to certify that the requirements described in Sections 2, 3 and 5 of this Appendix 5.3 have been met. [CDRL: Report on results of Pilot Phase 1]
 - 4.1.3.3 The SI shall submit a prototype of the Monthly Performance Report as defined in Appendix 8, based on actual Availability and performance of the System during Pilot Phase 1. [CDRL: Monthly performance report]
 - 4.1.3.4 The SI shall submit a usability improvement plan in accordance with Appendix 5.1. [CDRL: Usability improvement plan for Pilot Phase 1]
 - 4.1.3.5 The Pilot shall be considered complete when the MBTA approves (acting reasonably) the reports required in Sections 4.1.3.2 and 4.1.3.3 or grants a waiver in accordance with Section 6 of this Appendix 5.3.
- 4.2 Pilot Phase 2
The Users for Pilot Phase 2 shall be selected in accordance with Section 1.1 of this Appendix 5.3.
 - 4.2.1 Criteria for Commencement
 - 4.2.1.1 Thirty (30) calendar days have passed after the successful completion of the Pilot Phase 1.
 - 4.2.1.2 Installation of Vehicle Validators in full compliance with the Quantity Standards and Vehicle installation and removal requirements on:
 - 4.2.1.2.1 All Vehicles equipped as part of Pilot Phase 1, and
 - 4.2.1.2.2 If for Pilot Phase 1 the SI did not install Vehicle Validators on all Green Line Vehicles, then installation of Vehicle Validators in full compliance with the Quantity Standards and Vehicle installation and removal requirements on all Green Line Vehicles.
 - 4.2.1.2.3 If for Pilot Phase 1 the SI did not install Vehicle Validators on all Vehicles at one of the garages listed in Section 4.1.1.2, then installation of Vehicle Validators in full compliance with the Quantity Standards and Vehicle installation and removal requirements on all

- Vehicles identified in one of the garages listed in Section 4.1.1.2 of this Appendix 5.3.
- 4.2.1.3 Installation of Station Validators at all Stations on one additional Commuter Rail line (excluding the Fairmount line and in addition to the line selected for Pilot Phase 1) in full compliance with the Quantity Standards with respect to those Stations.
 - 4.2.1.4 Installation of at least one (1) Accessible Gate in each Fare Array at the Stations which serve as the most common transfer locations for Users of the Transportation Network served by the Vehicles and Stations selected for this Pilot, and in any case no fewer than forty (40) Gates overall. Gates in addition to the required Accessible Gates may be installed provided an Accessible Gate is installed in each specified Fare Array.
 - 4.2.1.4.1 If the SI elects to use Gate Option 2 or Gate Option 3, Gates compliant with first stage installation requirements (as described in Appendix 2.3) may be counted toward the number of Gates required for the Pilot.
 - 4.2.1.4.2 If the SI elects to use Gate Option 4, AFC 1.0 Gates compliant with first stage installation requirements (as described in Appendix 2.3) may be counted toward the number of Gates required for the Pilot.
 - 4.2.1.5 50% of Point of Sale Locations required for achievement of the Revenue Service Commencement Date are available and able to Enable Fare Cards and reload Accounts.
 - 4.2.1.5.1 At least one (1) Fare Vending Machine near each Fare Array at each Station equipped with an Accessible Gate as part of this Pilot.
 - 4.2.1.5.2 If the SI elects to use Retail Reload Locations to meet POS Quantity Standards, this shall include at least two (2) of each type of location proposed (i.e. independently owned and run stores, convenience stores, pharmacies or grocery stores).
 - 4.2.1.6 Availability of at least fifty (50) Inspection Devices.
 - 4.2.1.7 The DB Completion Date in respect of Pilot Phase 2 has occurred and all Devices required for Pilot Phase 2 are installed, ready to be placed into Revenue Service and able (as applicable) to Enable Fare Cards, reload Accounts and perform Inspection and Validation.
 - 4.2.1.8 All Account management functionality is available, without exception.
 - 4.2.1.9 The inventory of POS locations described in Appendix 2.10 has been updated.
 - 4.2.1.10 If a waiver was granted for Pilot Phase 1, all items in the Punch List must be completed.
- 4.2.2 Duration and Measurement
The SI shall measure and record the Availability of the Devices and other parts of the System that have been included in Pilot Phase 2 over a thirty (30)-day consecutive period. The Availability shall be measured in respect of the Pilot standards set out in Section 5 of this Appendix 5.3.
- 4.2.3 Criteria for Completion
- 4.2.3.1 The System must operate successfully for thirty (30) consecutive days meeting the standards of success defined for this Pilot in Section 5 of this Appendix 5.3.
 - 4.2.3.2 The SI shall submit a report on the results of Pilot Phase 2 to certify that the requirements described in Sections 2, 3 and 5 of this Appendix 5.3 have been met. [CDRL: Report on results of Pilot Phase 2]

- 4.2.3.3 The SI shall submit a prototype of the Monthly Performance Report as defined in Appendix 8, based on actual Availability and performance of the System during Pilot Phase 2. [CDRL: Monthly performance report]
- 4.2.3.4 The SI shall submit a usability improvement plan in accordance with Appendix 5.1. [CDRL: Usability improvement plan for Pilot Phase 2]
- 4.2.3.5 If a waiver was granted for Pilot Phase 1, all items in the Punch List must be completed.
- 4.2.3.6 The Pilot shall be considered complete when the MBTA approves (acting reasonably) the reports required in Sections 4.2.3.2 and 4.2.3.3 or grants a waiver in accordance with Section 6 of this Appendix 5.3.

5. Pilot Standards

| No. | Pilot standard | Measurement | Pilot | Measure |
|-----|---|--|---------------|----------|
| 1 | Gates (and Readers contained within) are operating in accordance with the Technical Requirements | Total Compliant Hours for all Gates (and Readers contained within) divided by the Total Potential Hours of Availability for all Gates, in the relevant 30 day period | Pilot Phase 1 | [≥90%] |
| | | | Pilot Phase 2 | [≥96%] |
| 2 | Validators (and Readers contained within) are operating in accordance with the Technical Requirements | Total Compliant Hours for all Validators (and Readers contained within) divided by the Total Potential Hours of Availability for all Validators, in the relevant 30 day period | Pilot Phase 1 | [≥90%] |
| | | | Pilot Phase 2 | [≥96%] |
| 3 | All Fare Vending Machines are operating in accordance with the Technical Requirements | Total Compliant Hours for all Fare Vending Machines divided by the Total Potential Hours of Availability for all Fare Vending Machines, included in the Pilot, in the relevant 30 day period | Pilot Phase 1 | [≥90%] |
| | | | Pilot Phase 2 | [≥95%] |
| 4 | Fare calculation – 100% of Fares and other amounts charged (including for Products and Enablement Fees), and travel entitlements validated, are calculated and applied correctly, in accordance with Fare Policy and Configuration, documented with supporting Data, and applied in the timeframes set forth in the Technical Requirements. | Number of compliant calculations divided by the total number of calculations, both in the relevant 30 day period | Pilot Phase 1 | [≥98%] |
| | | | Pilot Phase 2 | [≥99.5%] |

| | | | | |
|---|--|---|---------------|--------|
| 5 | All Administrator Interfaces and all respective APIs are operating in accordance with the Technical Requirements | Total Compliant Hours for the Administrator Interfaces plus the Total Compliant Hours for all respective APIs combined, divided by twice the Total Potential Hours of Availability for the Administrator Interfaces, for the relevant 30 day period | Pilot Phase 1 | [≥95%] |
| | | | Pilot Phase 2 | [≥99%] |
| 6 | The System Website, the Fare Card Mobile Application (if used to provide access to Account management functionality) and the IVR and each of their respective APIs are operating in accordance with the Technical Requirements | Total Compliant Hours for the least Available of (i) the System Website, (ii) the Fare Card Mobile Application (if used to provide access to Account management functionality), (iii) the IVR, and (iv) the corresponding APIs, divided by the average Total Potential Hours of Availability of (i) the System Website, (ii) the Fare Card Mobile Application (if used to provide access to Account management functionality), (iii) the IVR, and (iv) the corresponding APIs, all for the relevant 30 day period | Pilot Phase 1 | [≥95%] |
| | | | Pilot Phase 2 | [≥99%] |
| 7 | The System is compliant with all Account Data Timeliness Standards | Number of transactions and other triggering events that meet the Account Data Timeliness Standards divided by the total number of transactions and other triggering events covered by the Account Data Timeliness Standards, for the relevant 30 day period | Pilot Phase 1 | [≥95%] |
| | | | Pilot Phase 2 | [≥99%] |
| 8 | Any External Interfaces are operating and maintained in accordance with the Technical Requirements | Total Compliant Hours for the least Available External Interface divided by the average Total Potential Hours of Availability for all External Interfaces | Pilot Phase 1 | [≥90%] |
| | | | Pilot Phase 2 | [≥96%] |

6. Failure to Meet Criteria for Completion of Pilots

6.1 Waiver of Pilot Completion Requirement

The SI may submit a written request for a waiver from the MBTA in respect of certain completion requirements for Pilots, subject to the terms and conditions of this Section 6. In order for each of Pilot Phase 1 and Pilot Phase 2 to be considered complete through the waiver process, the SI must request and receive waiver(s) in writing from the MBTA. The SI's request(s) shall include:

- 6.1.1 An explanation of why the waiver is being requested;
- 6.1.2 A Punch List of System Elements not compliant with the Contract Standards;
- 6.1.3 For each item on the Punch List, an explanation of how and when compliance will be demonstrated;
- 6.1.4 A statement confirming that all safety and information security requirements established by the Contract Standards have been met;
- 6.1.5 An explanation of how the items on the Punch List will not negatively impact MBTA operations or revenue collection; and
- 6.1.6 A commitment from the SI to resolve all areas of non-compliance before the achievement of the next milestone. For a Pilot Phase 1 waiver, all Punch List items shall be addressed prior to completion of Pilot Phase 2 and for a Pilot Phase 2 waiver, all Punch List items shall be addressed prior to the Revenue Service Commencement Date.

[CDRL: Request for waiver of Pilot Phase 1 milestone requirement] [CDRL: Request for waiver of Pilot Phase 2 milestone requirement]

The MBTA, acting reasonably, will consider any such waiver request in accordance with Appendix 7 (MBTA Review Procedures). Without limiting any right of the MBTA hereunder, the MBTA shall have no obligation to grant any such waiver if the SI's request does not comply with the foregoing requirements or if there is any failure of compliance with any safety or information security requirements established by the Contract Standards or if the MBTA reasonably believes that the items on the Punch List will negatively impact MBTA operations or revenue collection.

- 6.2 In the event the criteria for completion of a Pilot are not met, or the MBTA does not agree to waive a Pilot completion requirement, the SI must:
 - 6.2.1 Develop and implement a Remediation Plan and document all the work completed by the SI to resolve the deviations and exceptions prior to the MBTA devoting further resources to re-performing the Pilot. [CDRL: Remediation Plan]
 - 6.2.2 The SI will continue re-performing this work until all of the requirements set out in this Appendix 5.3 are met.

7. Experience

Proposer shall provide a narrative which describes its experience, or the experience of its Proposer Team members, in performing the services or using the approach described in this Appendix 5.3. The narrative should identify at least one reference project where (i) the Proposer or the member of the Proposer Team held at least 50% of the responsibility relating to such services or approach, and (ii) the Proposer employed the approach or equipment proposed herein. A single Submittal shall cover this requirement and the team experience requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.13, 2.14 and 2.16. [PSR: Proposer team experience: Implementation, expansion, DB oversight and testing]

APPENDIX 5.4

CRITERIA FOR REVENUE SERVICE COMMENCEMENT

Wherever this Project Agreement identify preconditions for “Transition” or “Revenue Service Commencement”, including all preconditions listed in this Appendix 5.4 (together referred to as the **Criteria for Revenue Service Commencement**), the Transition Period shall not begin and the Revenue Service Commencement Date shall not be established until all such Criteria for Revenue Service Commencement are satisfied.

1. General Requirements

The following are included in the Criteria for Revenue Service Commencement:

- 1.1 The DB Completion Milestone in respect of the Revenue Service Commencement Date shall have been achieved.
- 1.2 The SI shall demonstrate and certify to the MBTA that System Elements to be installed are fully compliant with the Contract Standards, using the testing requirements specified in Appendix 2.16.
- 1.3 Successful completion of the Pilot Phase 2, as defined in Appendix 5.3.
- 1.4 Installation of at least one Validator at every door of every Vehicle.
- 1.5 Gate installation
 - 1.5.1 To the extent that the SI chooses Gate Option 1 (defined in Appendix 2.3):
Installation (directly and by reflecting applicable requirements in the DB Plans and Specifications) and completion of commissioning (by the SI) of at least two Gates in each Gate Array capable of processing Media, including at least one Accessible Gate in each Gate Array.
 - 1.5.2 To the extent that the SI chooses Gate Option 2, Gate Option 3, or Gate Option 4 (defined in Appendix 2.3):
Installation (directly and by reflecting applicable requirements in the DB Plans and Specifications) and completion of commissioning (by the SI) of all Gates (achieving the first stage requirements for the chosen option).
 - 1.5.3 Each AFC 1.0 Gate in or on which any System Element is installed pursuant to Gate Option 4 (as defined in Appendix 2.3) shall be capable of accepting both AFC 1.0 Media and System Media.
- 1.6 Installation (directly and by reflecting applicable requirements in the DB Plans and Specifications) and completion of commissioning (by the SI) of the number of Fare Vending Machines specified in this Section 1.6 in the vicinity of every Gate Array. Vicinity in this case means, for example, that if there are multiple entrances to the Location, Fare Vending Machines are placed at all entrances, and if multiple assemblages of AFC 1.0 FVMs exist, AFC 2.0 Fare Vending Machines exist in as close as possible within Station constraints.
 - 1.6.1 At least four (4) Fare Vending Machines in the vicinity of every Gate Array for the top ten (10) Stations by ridership;
 - 1.6.2 At least two (2) Fare Vending Machines in the vicinity of every Gate Array for Arrays which currently include more than two (2) AFC 1.0 FVMs; and

-
- 1.6.3 At least two (2) Fare Vending Machines in the vicinity of every Gate Array for Arrays which currently include two (2) or fewer AFC 1.0 FVMs and where the MBTA has not granted a waiver; and
 - 1.6.4 At least one (1) Fare Vending Machine in the vicinity of every Gate Array for Arrays which currently include two (2) or fewer AFC 1.0 FVMs and the MBTA has granted a waiver.
 - 1.6.4.1 The SI may submit a written request for approval from the MBTA to install only a single FVM in Arrays with space limitations which result in no suitable installation for a second FVM. In order obtain any such approval, the SI must request and receive a waiver in writing from the MBTA. The SI's request shall identify each Station and Array and include a description of the space limitations for each Array for which a waiver is being requested. [CDRL: Request for waiver of Station FVM quantity requirement for Revenue Service Commencement]
 - 1.7 Installation (directly and by reflecting applicable requirements in the DB Plans and Specifications) and completion of commissioning (by the SI) of at least half (fifty percent (50%)) of the final required number of Station Validators (as required by the Quantity Standards) for each platform (including at least one at any level boarding location/mini-high platform).
 - 1.8 Subject to Section 1.8.1, demonstration of deployment of sufficient Point of Sale Locations (inclusive of the Retail Reload Locations and Fare Vending Machines) to meet the Quantity Standards.
 - 1.8.1 The MBTA may, upon submission of a Remediation Plan from the SI, conditionally agree to consider the Point of Sale network sufficient for purposes of the Revenue Service Commencement Date when at least 90% of the total Point of Sale Locations required to meet the Quantity Standards are demonstrated to be deployed, but in no event will such an agreement be made if the temporary deviation from the Quantity Standards disproportionately disadvantages any particular community, region, or protected class.
 - 1.9 The inventory of POS Locations described in Appendix 2.10 has been updated, including the service hours.
 - 1.10 Delivery of all Submittals identified in the Technical Requirements as due prior to the Revenue Service Commencement Date.
 - 1.11 Delivery of the Requisite Deposit Materials to the Escrow Agent as described in Article 16 of this Project Agreement. [CDRL: Requisite Deposit Materials]
 - 1.12 The SI shall complete all development, implementation, and testing of all balance conversion process in such time as to allow the MBTA thirty (30) days of use of the delivered proposed production versions of such balance conversion process prior to the Revenue Service Commencement Date, as described in Appendix 4.4.
 - 1.13 The Master Maintenance Plan has been accepted by the MBTA, as described in Appendix 9.
 - 1.14 The SI shall complete the development, implementation and testing of the External Interfaces for the inspection violation and reduced fare eligibility in such time as to allow the MBTA thirty (30) days of use of the delivered proposed production versions of those External Interfaces prior to the Revenue Service Commencement Date, as described in Appendix 3.10.

- 1.15 To the extent that Gate Option 4 is proposed for use (as described in Appendix 2.3), the SI shall, directly and by including applicable requirements in the DB Plans and Specifications, provide a Gate Transition Demonstration of the Gate Option 4 Second Stage Work as described in Appendix 2.16.
- 1.16 A training program has been delivered for all System Elements to all Personnel who will interact with the System.
- 1.17 If a waiver was granted for Pilot Phase 2, completion of all items in the Punch List.

2. Notice

The SI shall provide the MBTA with 30 days' advance written notice (as described in Section 6 of the Project Agreement) of the expected date of satisfaction of all Criteria for Revenue Service Commencement. [CDRL: Notice of expected date of satisfaction of Milestone conditions]

APPENDIX 5.5

CRITERIA FOR TRANSITION PERIOD COMPLETION

Upon Transition Period Completion, System Media will be accepted at all Locations and on all Vehicles, which will enable the MBTA to discontinue acceptance of AFC 1.0 Media.

1. Acceptance of Legacy Media

The SI shall not remove AFC 1.0 Equipment required to support the acceptance of AFC 1.0 Media from any AFC 1.0 Gate, Gate, or Vehicle prior to Transition Period Completion.

2. Criteria for Transition Period Completion

The following are the “Criteria for Transition Period Completion”:

- 2.1 A minimum of three Months have elapsed since the Revenue Service Commencement Date.
- 2.2 The Systems Integrator has achieved a level of performance such that Deductions during the last full Month occurring during the Transition Period total no more than five percent (5%) of the Base Monthly Payment for such Month, and the Systems Integrator has provided the applicable Monthly Performance Report.
- 2.3 All Gates and AFC 1.0 Gates accept Media in accordance with the Contract Standards, except that:
 - 2.3.1 To the extent the SI chooses Gate Option 1 (complete gate replacement) as described in Appendix 2.3 in respect of any Gate Array:
 - 2.3.1.1 One (1) existing AFC 1.0 Gate in each such Gate Array may remain in its original AFC 1.0 state (accepting only AFC 1.0 Media) and replacement of that gate with a System Gate is not part of the Media acceptance required under the Criteria for Transition Period Completion; and
 - 2.3.1.2 Any such AFC 1.0 Gate shall be fully replaced with a System Gate by the Full Service Commencement Date.
- 2.4 The Installation of all (100%) Validators and Fare Vending Machines required to meet the Quantity Standards is complete and in full compliance with the Contract Standards; provided that:
 - 2.4.1 System Elements associated with a Planned Expansion shall be excluded from the Criteria for Transition Period Completion as and to the extent provided in Section 11.1(D) of the Project Agreement; and
 - 2.4.2 System Elements associated with a Planned Expansion shall be excluded from the Criteria for Transition Period Completion if the MBTA elects to require a person other than the SI or the DB Entity to perform the Installation associated with such Planned Expansion, as provided in Appendix 2.8.
- 2.5 The DB Completion Milestone in respect of the Revenue Service Commencement Date shall have been achieved.
- 2.6 All (100%) of the required Inspection Devices required to meet the Quantity Standards have been provided and the Systems Integrator has delivered the first quarterly Quantity Standards compliance report as described in Appendix 2.10.

- 2.7 All (100%) of the required Point of Sale Locations required to meet the Quantity Standards are Available.
- 2.8 The inventory of POS locations described in Appendix 2.10 has been updated.
- 2.9 The SI has completed the migration of all existing MBTA corporate and Group Accounts as described in Appendix 4.4.

3. Notice

The SI shall provide the MBTA with thirty (30) days' advance written notice (as described in Section 6.13 of the Project Agreement) of the expected date of satisfaction of all Criteria for Transition Period Completion.

APPENDIX 5.6

CRITERIA FOR FULL SERVICE COMMENCEMENT

Subject to Section 6.11 of the Project Agreement, the Full Service Commencement Date is the date when Installation of all (100%) System Elements required to meet the Quantity Standards is complete and in full compliance with the Contract Standards.

1. Criteria for Full Service Commencement

The following are the “Criteria for Full Service Commencement”:

- 1.1 Transition Period Completion has occurred.
- 1.2 Installation of all (100%) System Gates required to meet the Quantity Standards is complete and satisfies the Technical Requirements, including:
 - 1.2.1 If the SI chooses Gate Option 2, Gate Option 3, or Gate Option 4, the Second Stage Work defined in Appendix 2.3 shall be complete for all AFC 1.0 Gates; provided that:
 - 1.2.2 Gates associated with a Planned Expansion shall be excluded from the Criteria for Full Service Commencement as and to the extent provided in Section 11.1(D) of the Project Agreement;
 - 1.2.3 Gates associated with a Planned Expansion shall be excluded from the Criteria for Full Service Commencement if the MBTA elects to require a person other than the SI or the DB Entity to perform the installation of associated with such Planned Expansion, as provided in Appendix 2.8.
- 1.3 The SI has completed all actions required in respect of corrective maintenance under Appendix 4.6 for all Problems and failures which occur during the Transition Period and following the achievement of Transition Period Completion, including completion of the correction of all errors, Defects and failures.
- 1.4 The SI has resolved all items on the Punch List (using the method defined on the approved Punch List), including any Punch List items remaining as of the Revenue Service Commencement Date, as described in Appendix 5.4.
- 1.5 The MBTA has accepted the SI’s Documentation that the Implementation Work performed was consistent with the safety certification program as described in Appendix 2.11. [CDRL: Documentation of safety certification compliance]
- 1.6 All Submittals required on or before the Full Service Commencement Date have been submitted and accepted by the MBTA in accordance with Appendix 7 (MBTA Review Procedures).
- 1.7 The SI has delivered “as-installed” drawings and procedures for Vehicle Installations in accordance with Appendix 2.12.
- 1.8 The Requisite Deposit Materials have been delivered to the Escrow Agent in accordance with Article 16 of this Project Agreement. [CDRL: Requisite Deposit Materials]

2. Notice

The SI shall provide the MBTA with thirty (30) days' advance written notice (as described in Section 6.13 of the Project Agreement) of the expected date of satisfaction of all Criteria for Full Service Commencement. [CDRL: Notice of expected date of satisfaction of Milestone conditions]

SCHEDULE D
DRAFT PROJECT AGREEMENT

PROJECT AGREEMENT

FOR AUTOMATED FARE COLLECTIONS SYSTEM SERVICES

between

THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

and

[SYSTEMS INTEGRATOR]

Dated

[_____, __ 2017]

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TABLE OF CONTENTS

Page

ARTICLE 1

DEFINITIONS AND INTERPRETATION

| | | |
|--------------|---|---|
| Section 1.1. | DEFINITIONS | 2 |
| Section 1.2. | INTERPRETATION..... | 2 |
| | (A) Plurality..... | 2 |
| | (B) Persons | 2 |
| | (C) Headings..... | 2 |
| | (D) References Hereto | 2 |
| | (E) References to Days and Time of Day | 2 |
| | (F) References to Including | 2 |
| | (G) References to Statutes | 2 |
| | (H) References to Governmental Bodies | 2 |
| | (I) References to Documents and Standards | 2 |
| | (J) Industry Terms | 3 |
| | (K) References to MBTA-Specific Terms..... | 3 |
| | (L) References to Dollar Amounts | 3 |
| | (M) References to All Reasonable Efforts | 3 |
| | (N) Discretion..... | 3 |
| | (O) References to Promptly | 3 |
| | (P) Obligations to Provide Assistance | 3 |
| | (Q) Party Bearing Cost of Performance..... | 3 |
| | (R) Entire Project Agreement..... | 3 |
| | (S) Counterparts..... | 4 |
| | (T) Governing Law | 4 |
| | (U) Severability | 4 |
| | (V) Drafting Responsibility | 4 |
| | (W) Interpolation | 4 |
| | (X) Accounting and Financial Terms | 4 |
| | (Y) Applicability, Stringency and Consistency of Contract Standards | 4 |
| | (Z) Third-Party Rights..... | 4 |

ARTICLE 2

REPRESENTATIONS AND WARRANTIES

| | | |
|--------------|---|---|
| Section 2.1. | REPRESENTATIONS AND WARRANTIES OF THE MBTA | 6 |
| | (A) Due Authorization..... | 6 |
| | (B) No Conflict..... | 6 |
| | (C) No Approvals Required | 6 |
| | (D) No Litigation | 6 |
| | (E) No Other Representation or Warranty | 6 |
| Section 2.2. | REPRESENTATIONS AND WARRANTIES OF THE SYSTEMS INTEGRATOR | 6 |
| | (A) Existence and Powers..... | 6 |

| | | |
|-----|---|---|
| (B) | Due Authorization and Binding Obligation | 7 |
| (C) | No Conflict..... | 7 |
| (D) | No Approvals Required | 7 |
| (E) | No Litigation Affecting the Systems Integrator | 7 |
| (F) | No Litigation Affecting the Project Contractors | 7 |
| (G) | Intellectual Property | 7 |
| (H) | Information Supplied by the Systems Integrator | 8 |
| (I) | Systems Integrator Reviews | 8 |
| (J) | Compliance with Applicable Law Generally | 8 |
| (K) | Representations as to the Financial Model..... | 8 |

ARTICLE 3

TERM

| | | |
|--------------|----------------------------------|----|
| Section 3.1. | EFFECTIVE DATE AND TERM | 9 |
| | (A) Initial Term | 9 |
| | (B) Renewal Term | 9 |
| | (C) Effect of MBTA Election..... | 9 |
| | (D) Accrued Rights..... | 9 |
| Section 3.2. | SURVIVAL | 10 |
| Section 3.3. | GRANT OF RIGHT..... | 10 |

ARTICLE 4

FINANCING PERIOD

| | | |
|--------------|---|----|
| Section 4.1. | FINANCIAL CLOSE | 11 |
| | (A) Financial Close Process | 11 |
| | (B) Satisfaction Prior to Effective Date..... | 11 |
| Section 4.2. | IMPLEMENTATION WORK DURING THE FINANCING PERIOD | 11 |
| Section 4.3. | FINANCIAL CLOSE DEADLINE | 11 |
| Section 4.4. | FINANCIAL CLOSE SECURITY | 12 |
| | (A) Requirements | 12 |
| | (B) MBTA Drawing Rights..... | 12 |
| | (C) Return of Financial Close Security | 12 |

ARTICLE 5

GENERAL REQUIREMENTS AND CONDITIONS

| | | |
|--------------|--|----|
| Section 5.1. | CONTRACT STANDARDS | 13 |
| | (A) Generally..... | 13 |
| | (B) Application of Good Industry Practice | 13 |
| Section 5.2. | BACKGROUND INFORMATION AND INDEPENDENT DILIGENCE..... | 13 |
| | (A) Information Provided by or on Behalf of the MBTA..... | 13 |
| | (B) Responsibility for Independent Diligence..... | 14 |
| | (C) No Reliance on Unincorporated Statements or Representations..... | 14 |
| Section 5.3. | RESPONSIBILITY FOR SYSTEMS INTEGRATOR PERSONS | 15 |
| Section 5.4. | ASSUMPTION OF RISK AND RESPONSIBILITY | 15 |
| Section 5.5. | COMPLIANCE WITH APPLICABLE LAW | 15 |

| | | |
|---------------|---|----|
| | (A) Compliance Obligation | 15 |
| | (B) Governmental Approvals | 15 |
| | (C) Registration, Licensing and Certification Requirements | 16 |
| | (D) Investigations of Non-Compliance | 16 |
| | (E) Fines, Penalties and Remediation | 17 |
| Section 5.6. | FINANCIAL BOOKS AND RECORDS..... | 17 |
| | (A) Recordkeeping Requirements | 17 |
| | (B) Inspection, Audit and Adjustment..... | 18 |
| Section 5.7. | DELIVERY OF DOCUMENTS..... | 18 |
| | (A) Systems Integrator..... | 18 |
| | (B) MBTA | 18 |
| Section 5.8. | BUSINESS RESTRICTIONS..... | 19 |
| | (A) No Other Business | 19 |
| | (B) Opportunities..... | 19 |
| Section 5.9. | CERTAIN NOTICES | 19 |
| | (A) Notice of Defect..... | 19 |
| | (B) Notice of Default..... | 19 |
| Section 5.10. | EMERGENCIES..... | 19 |
| Section 5.11. | ACCESS TO MBTA PROPERTY AND OTHER LOCATIONS..... | 19 |
| | (A) SI Access Right..... | 19 |
| | (B) Locations Not Owned or Controlled by the MBTA..... | 20 |
| | (C) Maintenance of Existing Operations | 20 |
| | (D) MBTA Cooperation Generally..... | 20 |
| | (E) Third Party Agreements | 20 |
| | (F) POS Required Locations and Distributed Locations Generally | 20 |
| | (G) POS Required Locations and Distributed Locations – Fare Vending Machines | 21 |
| | (H) MBTA Cooperation and Costs Related to POS Required Locations and Distributed Locations | 21 |
| | (I) SI Locations | 22 |

ARTICLE 6

IMPLEMENTATION WORK

| | | |
|--------------|---|----|
| Section 6.1. | IMPLEMENTATION WORK GENERALLY | 23 |
| | (A) Commencement and Prosecution of Implementation Work | 23 |
| | (B) Systems Integrator Control of the Implementation Work; No MBTA Responsibility..... | 23 |
| | (C) General Obligations of the Systems Integrator | 23 |
| | (D) Project Schedule and Reports..... | 24 |
| | (E) Naming and Signs | 25 |
| | (F) Title and Risk of Loss | 25 |
| | (G) Encumbrances | 25 |
| Section 6.2. | SYSTEM DESIGN | 25 |
| | (A) Technical Requirements..... | 25 |
| | (B) Performance of System Design Work..... | 25 |
| | (C) System Design Team | 26 |
| | (D) Documents at the Model Office | 26 |
| Section 6.3. | REGULATED CONDITIONS | 26 |
| | (A) Existing Condition of Vehicles | 26 |

| | | |
|---------------|---|----|
| | (B) Additional Obligations | 27 |
| Section 6.4. | SI INSTALLATION WORK | 27 |
| | (A) Scope of the SI Installation Work | 27 |
| | (B) Installation Commencement Date | 28 |
| | (C) Vehicles..... | 28 |
| | (D) Retail Reload Locations | 28 |
| | (E) SI Project Manager..... | 28 |
| Section 6.5. | DB INSTALLATION WORK | 29 |
| | (A) MBTA Responsibilities..... | 29 |
| | (B) Systems Integrator Responsibilities Generally | 29 |
| | (C) Changes to DB Plans and Specifications | 30 |
| | (D) Systems Integrator Review of Submittals | 30 |
| | (E) DB Governmental Approvals..... | 30 |
| | (F) System Elements | 30 |
| | (G) Monitoring and Inspecting the DB Installation Work..... | 31 |
| | (H) Schedule Requirements; Achievement of Substantial Completion..... | 31 |
| | (I) Systems Integrator Cost Responsibilities..... | 32 |
| Section 6.6. | MONITORING, OBSERVATIONS AND TESTING | 32 |
| | (A) Observation and Access | 32 |
| | (B) Systems Integrator Tests and Inspections | 33 |
| | (C) MBTA Tests and Inspections..... | 33 |
| | (D) Certificates and Reports | 33 |
| | (E) Independent Certifier | 33 |
| Section 6.7. | CORRECTION OF IMPLEMENTATION WORK | 33 |
| Section 6.8. | INDEPENDENT CERTIFIER..... | 33 |
| | (A) Generally..... | 33 |
| | (B) Qualifications | 33 |
| | (C) Appointment and Replacement | 34 |
| | (D) Limitations | 34 |
| Section 6.9. | JOINT APPROVALS, COOPERATION AND COST RELATING TO INDEPENDENT CERTIFIER..... | 34 |
| | (A) Joint Approval Required | 34 |
| | (B) Cooperation and Cost..... | 35 |
| Section 6.10. | INDEPENDENT CERTIFIER AS MEDIATOR..... | 35 |
| Section 6.11. | COMPLETION SCHEDULE | 35 |
| | (A) Achievement of Milestones..... | 35 |
| | (B) Milestone Conditions | 35 |
| | (C) Installation Commencement Date | 36 |
| | (D) Pilots | 36 |
| | (E) Revenue Service Commencement Date | 36 |
| | (F) Transition Period Completion | 37 |
| | (G) Full Service Commencement Date..... | 38 |
| | (H) Effect of Issuance of Certificates | 38 |
| | (I) Removal of Existing System Fareboxes | 38 |
| Section 6.12. | TRANSITION PERIOD | 39 |
| | (A) Purpose and Extension | 39 |
| | (B) Operations and Maintenance..... | 39 |
| | (C) Periods Overlap..... | 39 |

ARTICLE 7

OPERATION AND MANAGEMENT OF THE SYSTEM

| | | |
|--------------|--|----|
| Section 7.1. | OPERATING SERVICES GENERALLY | 40 |
| | (A) General Responsibilities | 40 |
| | (B) Operating Services Manager | 40 |
| Section 7.2. | MBTA FARE POLICY | 41 |
| | (A) MBTA Authority Generally | 41 |
| | (B) Implementation of Fare Policy | 41 |
| | (C) Group Programs | 41 |
| Section 7.3. | FARE REVENUES..... | 41 |
| | (A) Property of the MBTA | 41 |
| | (B) Services and Deposit Account | 41 |
| | (C) Payment Service Providers | 42 |
| Section 7.4. | FARE CARDS AND FARE PRODUCTS | 42 |
| | (A) Systems Integrator Responsibilities | 42 |
| | (B) Purchase Prices | 43 |
| Section 7.5. | OTHER USER-FACING SERVICES | 43 |
| | (A) Accounts..... | 43 |
| | (B) System Website..... | 43 |
| | (C) Customer Support Software | 43 |
| Section 7.6. | INSPECTION DEVICES | 43 |
| Section 7.7. | UTILITIES..... | 43 |
| | (A) Communications Network | 43 |
| | (B) All Other Utilities..... | 43 |
| Section 7.8. | MBTA ACCESS RIGHTS; INSPECTIONS AND TESTING..... | 43 |
| | (A) Data | 43 |
| | (B) Observation and Access | 44 |
| | (C) Systems Integrator Tests and Inspections | 44 |
| | (D) MBTA Tests and Inspections..... | 44 |
| | (E) Certificates and Reports | 44 |
| Section 7.9. | KEY PERFORMANCE INDICATORS..... | 44 |
| | (A) Monitoring and Reporting..... | 44 |
| | (B) Failures of Compliance with Key Performance Indicators | 44 |

ARTICLE 8

MAINTENANCE, REPAIR, REPLACEMENT AND HANDBACK

| | | |
|--------------|--|----|
| Section 8.1. | MAINTENANCE, REPAIR AND REPLACEMENT | 45 |
| | (A) Master Maintenance Plan..... | 45 |
| | (B) Maintenance, Repair and Replacements | 45 |
| | (C) Software Maintenance..... | 45 |
| | (D) Standards for Replacement of System Elements..... | 46 |
| | (E) Performance of System Element Repair or Replacement Work | 46 |
| Section 8.2. | VANDALISM..... | 47 |
| | (A) Generally..... | 47 |
| | (B) Vandalism Reserve Account | 47 |
| | (C) Withdrawal of Amounts due to Vandalism..... | 47 |
| | (D) Vandalism Reserve Amount and Annual Adjustment | 48 |

| | | |
|--------------|--|----|
| | (E) Accrued Interest | 48 |
| | (F) MBTA Cost Responsibility for Vandalism..... | 48 |
| Section 8.3. | MAINTENANCE INSPECTIONS AND ASSESSMENTS..... | 48 |
| Section 8.4. | HANDBACK REQUIREMENTS AND RESERVE ACCOUNT..... | 49 |
| | (A) Required Condition | 49 |
| | (B) Reserve Account | 49 |
| Section 8.5. | FUNDING AND WITHDRAWAL | 49 |
| | (A) Handback Reserve Amount..... | 49 |
| | (B) Funding | 49 |
| | (C) Deductions from Monthly Payments | 50 |
| | (D) Withdrawals Prior to Termination Date | 50 |
| | (E) Withdrawal in Connection with Expiration | 50 |
| | (F) Termination Prior to Expiration | 51 |
| | (G) Accrued Interest | 51 |
| Section 8.6. | HANDBACK LETTER OF CREDIT | 51 |
| | (A) Systems Integrator Right..... | 51 |
| | (B) MBTA Drawing Rights..... | 51 |
| | (C) Return of Handback Letter of Credit | 52 |

ARTICLE 9

PERSONNEL, LABOR AND CONTRACTING PRACTICES

| | | |
|--------------|---|----|
| Section 9.1. | PERSONNEL | 53 |
| | (A) Key Personnel | 53 |
| | (B) Contact Information | 53 |
| | (C) Staffing Generally | 53 |
| | (D) Disputes..... | 53 |
| | (E) Fair Employment Practices | 54 |
| Section 9.2. | PROJECT CONTRACTORS AND SUBCONTRACTORS | 54 |
| | (A) Generally..... | 54 |
| | (B) Required Use of Project Contractors..... | 54 |
| | (C) Restricted Persons | 54 |
| | (D) Diversity in Contracting..... | 54 |
| | (E) Terms and Actions | 54 |
| | (F) Indemnity for Claims | 55 |
| | (G) Reporting..... | 55 |
| Section 9.3. | MATERIAL CONTRACTS | 55 |
| | (A) MBTA Consents | 55 |
| | (B) Timeframe for Consents..... | 56 |
| | (C) Contracts with Affiliates | 56 |
| Section 9.4. | REPLACEMENT MATERIAL CONTRACTS | 57 |
| Section 9.5. | DELIVERY OF AMENDED OR REPLACEMENT MATERIAL CONTRACTS..... | 57 |

ARTICLE 10

PAYMENTS

| | | |
|---------------|---|----|
| Section 10.1. | PAYMENTS GENERALLY | 58 |
| | (A) Obligation to Make Monthly Payments | 58 |

| | | |
|---------------|--|----|
| | (B) Calculation of Monthly Payments..... | 58 |
| | (C) Limitation on Payments | 58 |
| | (D) No Waiver or Acceptance | 58 |
| Section 10.2. | INVOICING AND PAYMENT..... | 58 |
| | (A) Monthly Invoice..... | 58 |
| | (B) MBTA Review and Payment | 59 |
| Section 10.3. | TAXES..... | 59 |
| Section 10.4. | MBTA’S RIGHT OF SET OFF | 59 |
| Section 10.5. | BILLING STATEMENT DISPUTES | 59 |
| Section 10.6. | INTEREST ON OVERDUE AMOUNTS | 60 |

ARTICLE 11

CHANGES

| | | |
|---------------|---|----|
| Section 11.1. | MBTA CHANGES | 61 |
| | (A) MBTA Right to Require Changes..... | 61 |
| | (B) Corrections of Defects or Deficiencies Not a Change | 61 |
| | (C) Configuration Excluded | 61 |
| | (D) Planned Expansions | 61 |
| | (E) No Entitlement to Perform a Change | 62 |
| | (F) Restrictions on MBTA Changes | 62 |
| | (G) Emergencies | 62 |
| Section 11.2. | CHANGE NOTICE AND RESPONSE..... | 63 |
| | (A) MBTA Change Notice | 63 |
| | (B) Implementation Proposal | 63 |
| | (C) Review and Evaluation of Implementation Proposal..... | 65 |
| | (D) MBTA Response..... | 65 |
| | (E) Change Order | 65 |
| | (F) Withdrawal of MBTA Change Notice | 65 |
| Section 11.3. | CHANGE DIRECTIVES..... | 66 |
| Section 11.4. | MBTA CHANGE RESERVES | 66 |
| | (A) Establishment of Accounts..... | 66 |
| | (B) External Interfaces Reserve..... | 67 |
| | (C) Unplanned Expansions Reserve..... | 67 |
| | (D) Withdrawals from Accounts | 67 |
| | (E) MBTA Approval..... | 67 |
| | (F) Amounts in Excess of External Interfaces Reserve Account..... | 68 |
| | (G) Amounts in Excess Unplanned Expansions Reserve | 68 |
| | (H) Disposition of Amounts in Reserve Accounts | 68 |
| | (I) Accrued Interest..... | 69 |
| Section 11.5. | SI CHANGES | 69 |
| | (A) Restrictions..... | 69 |
| | (B) SI Change Request..... | 69 |
| | (C) MBTA Evaluation..... | 69 |
| | (D) MBTA Approval..... | 70 |
| | (E) Implementation of Approved Change..... | 70 |
| Section 11.6. | COST SAVINGS | 70 |
| | (A) MBTA Change or Remedial Change | 70 |
| | (B) SI Change Request and Shared Savings..... | 71 |
| | (C) Method of Payment..... | 71 |

| | | |
|---------------|------------------------------------|----|
| Section 11.7. | NO SUSPENSION OF PERFORMANCE | 71 |
|---------------|------------------------------------|----|

ARTICLE 12

EXPANSION TO REGIONAL TRANSIT PROVIDERS

| | | |
|---------------|--|----|
| Section 12.1. | APPLICABILITY | 72 |
| Section 12.2. | SI RESPONSIBILITIES | 72 |
| Section 12.3. | CONTRACTING WITH REGIONAL TRANSIT PROVIDERS | 72 |
| | (A) RTP Contract..... | 72 |
| | (B) Applicability of the Technical Requirements..... | 73 |
| | (C) Implementation Through MBTA Change..... | 73 |

ARTICLE 13

SUPERVENING EVENTS

| | | |
|---------------|---|----|
| Section 13.1. | SUPERVENING EVENTS GENERALLY | 74 |
| | (A) Extent of Relief Available to the Systems Integrator..... | 74 |
| | (B) General Limitations..... | 74 |
| | (C) No Relief from Payment Obligations..... | 74 |
| | (D) Mitigation Given Effect | 74 |
| | (E) Applicable Law Compliance..... | 74 |
| | (F) Contract Services Not Affected; Resumption of Performance | 74 |
| Section 13.2. | PROCEDURES RELATING TO SUPERVENING EVENTS | 74 |
| | (A) Notice and Written Report | 74 |
| | (B) Submittal of Relief Request | 75 |
| | (C) Updates and Additional Information..... | 75 |
| | (D) Delay in Notification..... | 75 |
| | (E) Multiple and Overlapping Claims..... | 76 |
| | (F) Burden of Proof and Mitigation | 76 |
| | (G) MBTA Response..... | 76 |
| | (H) Agreement or Dispute | 76 |
| Section 13.3. | CONDITIONS TO SCHEDULE RELIEF..... | 76 |
| | (A) Float in the Project Schedule..... | 76 |
| | (B) Required Demonstration for Schedule Relief Pertaining to the Implementation Work | 76 |
| Section 13.4. | SUPERVENING EVENTS – RELIEF EVENTS AND GENERALLY APPLICABLE RELIEF..... | 77 |
| | (A) Entitlement to Relief | 77 |
| | (B) Schedule Relief Pertaining to Implementation Work | 77 |
| | (C) Relief from Deductions..... | 77 |
| | (D) Monthly Payment Adjustments..... | 77 |
| Section 13.5. | SUPERVENING EVENTS – COMPENSATION EVENTS | 78 |
| | (A) Entitlement to Relief | 78 |
| | (B) Schedule Relief | 78 |
| | (C) Relief from Deductions..... | 78 |
| | (D) Adjustments to Availability Payments..... | 78 |
| | (E) Information Required for Compensation | 78 |
| | (F) Change in Costs | 78 |
| | (G) Financing Costs..... | 79 |

| | | |
|---------------|---|----|
| Section 13.6. | RECONCILIATION CALCULATION..... | 79 |
| | (A) Applicability and Calculation | 79 |
| | (B) Worse Position | 79 |
| | (C) Better Position..... | 80 |
| Section 13.7. | FORCE MAJEURE EVENTS | 80 |
| | (A) Effect of Force Majeure on Obligations..... | 80 |
| | (B) Systems Integrator as Affected Party | 80 |
| | (C) MBTA as Affected Party | 80 |
| | (D) Consultation | 80 |
| | (E) Notice of Cessation | 80 |
| Section 13.8. | CHANGES IN PAYMENT INDUSTRY STANDARDS | 80 |
| | (A) Entitlement to Relief | 80 |
| | (B) Independent Third Party..... | 81 |

ARTICLE 14

FINANCING AND REFINANCING

| | | |
|---------------|---|----|
| Section 14.1. | SYSTEMS INTEGRATOR RESPONSIBILITY TO FINANCE THE PROJECT..... | 82 |
| | (A) Systems Integrator Financing..... | 82 |
| | (B) Systems Integrator Liability | 82 |
| Section 14.2. | DEBT NON-RECOURSE TO MBTA..... | 82 |
| Section 14.3. | FINANCING DOCUMENTS | 82 |
| | (A) Restrictions and Mandatory Terms | 82 |
| | (B) Compliance with Financing Documents | 83 |
| | (C) Delivery of Changed Financing Documents | 83 |
| Section 14.4. | REFINANCING..... | 83 |
| | (A) Qualifying Refinancing | 83 |
| | (B) MBTA's Share of Refinancing Gain..... | 83 |
| | (C) Systems Integrator Proposal to Refinance | 83 |
| | (D) Audit Rights | 84 |
| | (E) Payment to the MBTA | 84 |
| | (F) Calculation of Refinancing Gain..... | 84 |
| | (G) Costs of Refinancing | 84 |
| | (H) Notice of any Other Refinancing | 84 |
| | (I) No Increased Termination Liabilities..... | 84 |
| Section 14.5. | FINANCING OF COSTS FOR WHICH THE MBTA IS RESPONSIBLE..... | 85 |
| | (A) Additional Financing..... | 85 |
| | (B) Failure to Obtain Additional Financing | 85 |
| | (C) Additional Financing and Deferred Compensation..... | 85 |
| Section 14.6. | FINANCIAL MODEL | 85 |
| | (A) Risk of Errors or Omissions | 85 |
| | (B) No Guaranteed Return | 85 |
| | (C) Use in Connection with Compensation Events | 85 |
| | (D) No Better and No Worse..... | 86 |
| | (E) Changes to Financial Model Logic and Formulae | 86 |
| | (F) Audit of Financial Model..... | 86 |
| | (G) Access and Approval | 86 |
| | (H) Revised Financial Model | 86 |

ARTICLE 15

ASSIGNMENT AND CHANGE IN CONTROL

| | | |
|---------------|---|----|
| Section 15.1. | ASSIGNMENT BY SYSTEMS INTEGRATOR..... | 88 |
| | (A) Restrictions..... | 88 |
| | (B) Factors the MBTA May Consider..... | 88 |
| Section 15.2. | LIMITATIONS ON CHANGE IN CONTROL | 88 |
| | (A) Change in Control Defined | 88 |
| | (B) Limitations | 89 |
| Section 15.3. | LIMITATION ON ASSIGNMENT BY THE MBTA..... | 90 |
| Section 15.4. | COSTS OF REQUEST FOR CONSENT | 90 |

ARTICLE 16

INTELLECTUAL PROPERTY RIGHTS

| | | |
|---------------|---|----|
| Section 16.1. | TRANSFERRED WORK PRODUCT | 91 |
| | (A) “Works Made for Hire”..... | 91 |
| | (B) Assignment..... | 91 |
| | (C) No Joint Ownership | 91 |
| | (D) Contracting for Work Product..... | 91 |
| | (E) Delivery and Unrelated Use..... | 91 |
| | (F) Standard Work Product..... | 92 |
| Section 16.2. | SYSTEMS INTEGRATOR INTELLECTUAL PROPERTY OWNERSHIP | 92 |
| Section 16.3. | THIRD PARTY SYSTEM ELEMENTS..... | 92 |
| | (A) Necessary Rights to Third Party System Elements..... | 92 |
| | (B) Source Code | 93 |
| | (C) Changes to System Elements | 93 |
| Section 16.4. | SOFTWARE ESCROW | 93 |
| | (A) Escrow Agreement..... | 93 |
| | (B) Requisite Deposit Materials | 94 |
| | (C) Quality of Source Code..... | 94 |
| | (D) Delivery of Requisite Deposit Materials..... | 95 |
| | (E) Inventory List and Certification..... | 95 |
| | (F) Inspection and Verification..... | 96 |
| | (G) Access and Use by the MBTA Prior to Release..... | 96 |
| | (H) Release and Delivery to the MBTA | 96 |
| | (I) Release of Source Code by Mutual Agreement | 97 |
| | (J) Restrictions on MBTA Use of Requisite Deposit Materials | 97 |
| | (K) Applicability Only to Requisite Deposit Materials..... | 97 |
| | (L) Term of Escrow Agreement..... | 97 |
| Section 16.5. | MBTA INTELLECTUAL PROPERTY, OWNERSHIP AND GRANT OF RIGHTS | 97 |
| | (A) MBTA Ownership..... | 97 |
| | (B) Grant of Rights to Systems Integrator in MBTA-Related Assets and IPR; Eligible Existing System Components..... | 98 |
| | (C) MBTA Trademarks | 98 |
| Section 16.6. | INTELLECTUAL PROPERTY INDEMNIFICATION..... | 98 |
| | (A) Applicability to Claims Relating to Intellectual Property Rights | 98 |
| | (B) Systems Integrator Response | 99 |

| | | |
|----------------|--|-----|
| | (C) Limited MBTA Indemnification | 99 |
| Section 16.7. | PERPETUAL GRANT OF RIGHTS TO THE MBTA | 100 |
| | (A) Rights in Front-End System Elements; SI System Elements | 100 |
| | (B) Rights in Front-End System Elements; Third Party System Elements | 100 |
| | (C) Rights in Standard Work Product | 100 |
| | (D) Rights in System APIs | 100 |
| | (E) Rights in Back-End System Elements..... | 100 |
| | (F) Perpetual Grant of Rights in Documentation | 101 |
| | (G) Perpetual Rights in Fare Card Materials, and Encryption and Access Keys .. | 101 |
| Section 16.8. | TRANSFER OF OWNERSHIP AND PERPETUAL GRANT OF RIGHTS WITH RESPECT TO SYSTEM WEBSITE..... | 101 |
| | (A) Ownership Transfer..... | 101 |
| | (B) Perpetual Grant of Rights..... | 101 |
| Section 16.9. | RIGHTS IN KEY ASSETS RELATING TO MBTA STEP-IN ACTION AND HANDBACK REQUIREMENTS | 102 |
| Section 16.10. | RIGHTS FROM PROJECT CONTRACTORS AND SUBCONTRACTORS | 102 |
| | (A) Obligation to Obtain Requisite Rights and IPR Protections | 102 |
| | (B) Clarifying Examples | 102 |
| Section 16.11. | SUBLICENSING RIGHTS | 102 |
| Section 16.12. | ADDITIONAL MBTA RIGHTS | 103 |
| | (A) Interoperability..... | 103 |
| | (B) Continuation of Rights | 103 |
| Section 16.13. | CERTAIN RESTRICTIONS ON MBTA RIGHTS | 103 |
| | (A) Exercise of License Rights..... | 103 |
| | (B) Transfer Restrictions | 103 |
| Section 16.14. | EXTENSION OF RIGHTS TO REGIONAL TRANSIT PROVIDERS | 103 |
| Section 16.15. | USE AS CLEARINGHOUSE | 103 |
| Section 16.16. | ORDER OF PRECEDENCE | 104 |
| Section 16.17. | PRELIMINARY INJUNCTIVE RELIEF..... | 104 |
| Section 16.18. | RIGHTS UNDER BANKRUPTCY CODE SECTION 365(n) | 104 |
| Section 16.19. | NO IMPLIED RIGHTS | 104 |
| Section 16.20. | SYSTEMS INTEGRATOR THIRD PARTY SYSTEM ELEMENTS OBLIGATIONS UPON TERMINATION DATE..... | 104 |

ARTICLE 17

INSURANCE, DAMAGE AND DESTRUCTION

| | | |
|---------------|--|-----|
| Section 17.1. | INSURANCE GENERALLY | 105 |
| | (A) Required Insurance | 105 |
| | (B) Project Contractors and Subcontractors | 105 |
| | (C) Inadequacy of Required Insurance..... | 105 |
| | (D) Compliance with Insurer Requirements..... | 105 |
| | (E) Failure to Provide Insurance Coverage | 105 |
| | (F) Reductions for Insurance Proceeds and Insurance Receivables..... | 105 |
| | (G) Relationship to Liability and Indemnity | 106 |
| Section 17.2. | NOTICE AND PROSECUTION OF INSURANCE CLAIMS | 106 |
| | (A) Reporting and Processing Claims | 106 |
| | (B) Systems Integrator Notice and Consultation..... | 106 |
| | (C) MBTA Notice | 107 |
| | (D) Failure of Performance; Inability to Collect | 107 |

| | | |
|---------------|---|-----|
| Section 17.3. | LOSS, DAMAGE OR DESTRUCTION | 107 |
| | (A) Protection | 107 |
| | (B) Repair of Property | 107 |
| | (C) Project Agreement Not Affected..... | 107 |
| | (D) Obligations Upon Damage or Destruction to Project..... | 107 |
| | (E) Application of Physical Damage Proceeds | 108 |
| Section 17.4. | REINSTATEMENT WORK | 108 |
| | (A) Draft Reinstatement Plan | 108 |
| | (B) Reinstatement Plan..... | 108 |
| | (C) Reinstatement Plan Details | 109 |
| | (D) Acceptance of Reinstatement Plan and Performance of Reinstatement Work | 109 |
| | (E) Physical Damage Proceeds | 109 |
| | (F) Payment for Reinstatement Work..... | 109 |
| | (G) Disposition of Physical Damage Proceeds..... | 110 |
| Section 17.5. | UNINSURABLE RISKS | 110 |
| | (A) Notice | 110 |
| | (B) Determination of Uninsurable Risk | 110 |
| | (C) Consequences of Uninsurable Risk..... | 110 |
| | (D) Continuation of Project Agreement | 111 |
| | (E) Obligations in Respect of Uninsurable Risks..... | 111 |
| | (F) Third Party Liability Insurance as an Uninsurable Risk | 111 |
| Section 17.6. | UNAVAILABLE INSURANCE CONDITIONS..... | 112 |
| | (A) Notice..... | 112 |
| | (B) Consequences of Unavailable Insurance Condition..... | 112 |
| | (C) Obligations in Respect of Unavailable Insurance Conditions..... | 112 |
| | (D) Alternative Terms and Conditions | 113 |
| Section 17.7. | BENCHMARKING OF INSURANCE COSTS..... | 113 |
| | (A) Purpose..... | 113 |
| | (B) Joint Insurance Cost Report | 113 |
| | (C) MBTA Review | 114 |
| | (D) MBTA Determination | 114 |
| | (E) Exceptional Cost | 114 |
| | (F) Exceptional Saving | 114 |
| | (G) No Exceptional Cost and No Exceptional Saving..... | 114 |

ARTICLE 18

INDEMNIFICATION

| | | |
|---------------|--|-----|
| Section 18.1. | SYSTEMS INTEGRATOR'S INDEMNITY | 115 |
| | (A) Scope of Indemnity | 115 |
| | (B) Limitation to Indemnity | 115 |
| | (C) Limited MBTA Indemnity | 116 |
| Section 18.2. | NOTICE OF CLAIMS..... | 116 |
| Section 18.3. | TENDER OF DEFENSE | 116 |
| | (A) Applicable Insurers | 116 |
| | (B) Systems Integrator..... | 116 |
| | (C) Acceptance of Tender of Defense..... | 117 |
| | (D) Conduct of Defense..... | 117 |
| | (E) Rejection of Tender of Defense | 117 |

| | | |
|-----|--|-----|
| (F) | Right to Assume Defense..... | 117 |
| (G) | Conduct of Defense by Indemnified Party..... | 118 |

ARTICLE 19

SECURITY FOR PERFORMANCE

| | | |
|---------------|-------------------------------------|-----|
| Section 19.1. | SECURITY FOR CONTRACT SERVICES..... | 119 |
| Section 19.2. | PROJECT CONTRACT GUARANTORS..... | 119 |

ARTICLE 20

DISPUTE RESOLUTION PROCEDURES

| | | |
|---------------|--|-----|
| Section 20.1. | PROCESS AND REQUIREMENTS..... | 120 |
| | (A) Generally..... | 120 |
| | (B) Informal Negotiations..... | 120 |
| | (C) MBTA Representative's Final Decision..... | 120 |
| | (D) Rights to Request and Decline Non-Binding Mediation..... | 121 |
| | (E) Procedure..... | 121 |
| | (F) Non-Binding Effect..... | 121 |
| | (G) Relation to Judicial Legal Proceedings..... | 121 |
| Section 20.2. | DB DISPUTE REVIEW BOARD..... | 121 |
| | (A) Establishment and Scope..... | 121 |
| | (B) Referral of Dispute..... | 121 |
| | (C) Relation to Judicial Legal Proceedings..... | 122 |
| | (D) Joinder of Disputes..... | 123 |
| Section 20.3. | FORUM FOR LEGAL PROCEEDINGS..... | 123 |
| Section 20.4. | CONTINUANCE OF PERFORMANCE DURING DISPUTE..... | 123 |
| Section 20.5. | COSTS OF DISPUTE RESOLUTION..... | 123 |

ARTICLE 21

REMEDIES OF THE PARTIES AND MBTA STEP-IN RIGHTS

| | | |
|---------------|---|-----|
| Section 21.1. | REMEDIES FOR BREACH..... | 124 |
| | (A) Generally..... | 124 |
| | (B) Remedies Available to the Systems Integrator..... | 124 |
| | (C) MBTA Remedies Cumulative..... | 124 |
| | (D) MBTA Liquidated Damage Rights..... | 124 |
| Section 21.2. | NO DUPLICATIVE RECOVERY..... | 125 |
| Section 21.3. | WAIVER OF REMEDIES..... | 125 |
| Section 21.4. | WAIVER OF CONSEQUENTIAL DAMAGES..... | 125 |
| Section 21.5. | MBTA STEP-IN RIGHTS..... | 126 |
| | (A) Right to Step-In..... | 126 |
| | (B) Notice..... | 126 |
| | (C) MBTA Step-In Action..... | 127 |
| | (D) Compensation Event Relief..... | 127 |
| | (E) Systems Integrator Fault..... | 127 |
| Section 21.6. | INCIDENT STOP ORDER..... | 127 |
| | (A) Right to Issue..... | 127 |

| | | |
|---------------|--|-----|
| | (B) Responsibility for Deductions; MBTA Change | 128 |
| Section 21.7. | SI REMEDIES FOR NONPAYMENT | 128 |
| Section 21.8. | REMEDIES FOR MUTUAL BREACH OF WARRANTY..... | 128 |

ARTICLE 22

SYSTEMS INTEGRATOR DEFAULT

| | | |
|---------------|---|-----|
| Section 22.1. | SYSTEMS INTEGRATOR EVENT OF DEFAULT | 130 |
| | (A) Definition | 130 |
| | (B) Notice by Systems Integrator | 132 |
| Section 22.2. | REMEIABLE BREACH..... | 132 |
| | (A) Definition | 132 |
| | (B) Notice and Cure Period | 133 |
| | (C) Extension of Cure Period | 133 |
| | (D) Cure of Misrepresentation Breach | 133 |
| Section 22.3. | MBTA REMEDIES UPON SYSTEMS INTEGRATOR EVENT OF DEFAULT | 134 |

ARTICLE 23

MBTA EVENTS OF DEFAULT

| | | |
|---------------|---|-----|
| Section 23.1. | MBTA EVENTS OF DEFAULT..... | 135 |
| | (A) Definition | 135 |
| | (B) Cure Period for Misrepresentation Breach..... | 136 |
| | (C) Cure of Misrepresentation Breach | 136 |
| Section 23.2. | SI REMEDIES UPON MBTA EVENT OF DEFAULT | 136 |

ARTICLE 24

TERMINATION

| | | |
|---------------|--|-----|
| Section 24.1. | EXCLUSIVE RIGHTS OF TERMINATION | 137 |
| | (A) Prior to Financial Close Date | 137 |
| | (B) Subsequent to Financial Close Date..... | 137 |
| | (C) MBTA Exercise of Termination Rights | 137 |
| Section 24.2. | TERMINATION FOR CONVENIENCE..... | 137 |
| | (A) MBTA Right | 137 |
| | (B) Termination Date | 137 |
| | (C) Termination Amount..... | 137 |
| | (D) Consideration for Convenience Termination Amount | 137 |
| Section 24.3. | TERMINATION FOR SYSTEMS INTEGRATOR EVENT OF DEFAULT | 137 |
| | (A) MBTA Right | 137 |
| | (B) Termination Date | 138 |
| | (C) Termination Amount..... | 138 |
| Section 24.4. | TERMINATION FOR MBTA EVENT OF DEFAULT | 138 |
| | (A) Systems Integrator Right..... | 138 |
| | (B) Termination Date | 138 |
| | (C) Termination Amount..... | 138 |
| Section 24.5. | TERMINATION BY COURT RULING..... | 138 |

| | | |
|----------------|--|-----|
| | (A) Termination Date | 138 |
| | (B) Termination Amount | 138 |
| Section 24.6. | TERMINATION FOR EXTENDED EVENTS..... | 138 |
| | (A) Termination Right | 138 |
| | (B) Termination Date | 138 |
| | (C) Termination Amount | 139 |
| | (D) MBTA Right to Reject..... | 139 |
| Section 24.7. | TERMINATION FOR UNINSURABLE RISK | 139 |
| | (A) MBTA Right | 139 |
| | (B) Termination Date | 140 |
| | (C) Termination Amount | 140 |
| | (D) SI Election to Continue | 140 |
| Section 24.8. | FULL AND FINAL SETTLEMENT..... | 141 |
| | (A) Exclusivity of Remedy..... | 141 |
| | (B) No Suit in Restitution Upon Payment of Termination Amount..... | 141 |
| Section 24.9. | ASSIGNMENTS AND TRANSFERS ON TERMINATION | 141 |
| | (A) Transfer Responsibilities..... | 141 |
| | (B) No Additional Compensation..... | 144 |
| Section 24.10. | TRANSITIONAL OBLIGATIONS..... | 144 |
| Section 24.11. | SYSTEMS INTEGRATOR TO COOPERATE | 144 |

ARTICLE 25

MISCELLANEOUS PROVISIONS

| | | |
|---------------|---|-----|
| Section 25.1. | RELATIONSHIP OF THE PARTIES | 146 |
| Section 25.2. | GENERAL DUTY TO MITIGATE | 146 |
| | (A) Mitigation by the Systems Integrator | 146 |
| | (B) Mitigation by the MBTA | 146 |
| Section 25.3. | PROJECT AGREEMENT ADMINISTRATION..... | 147 |
| | (A) Designation of Authorized Representatives..... | 147 |
| | (B) Authority of MBTA Representative..... | 147 |
| | (C) Administrative Communications | 147 |
| | (D) Contract Administration Memoranda | 147 |
| | (E) Procedure | 147 |
| | (F) Effect..... | 148 |
| Section 25.4. | AMENDMENTS | 148 |
| Section 25.5. | MBTA APPROVALS AND CONSENTS..... | 148 |
| Section 25.6. | WAIVERS | 148 |
| Section 25.7. | ACTIONS OF THE MBTA ENTITIES IN THEIR GOVERNMENTAL CAPACITY..... | 148 |
| Section 25.8. | CONFIDENTIALITY | 149 |
| | (A) Confidential Information..... | 149 |
| | (B) Exceptions..... | 149 |
| | (C) Security Plan | 149 |
| | (D) Public Communications of Confidential Information..... | 149 |
| | (E) Equitable Relief..... | 150 |
| Section 25.9. | PERSONAL INFORMATION | 150 |
| | (A) General | 150 |
| | (B) Specific Commonwealth Requirements | 150 |
| | (C) Security Breach | 150 |

| | | |
|----------------|---|-----|
| Section 25.10. | COMPLIANCE WITH MATERIAL AGREEMENTS | 151 |
| Section 25.11. | BINDING EFFECT | 151 |
| Section 25.12. | NOTICES..... | 151 |
| | (A) Procedure | 151 |
| | (B) MBTA Notice Address | 151 |
| | (C) Systems Integrator Notice Address..... | 152 |
| Section 25.13. | NOTICE OF LITIGATION | 152 |
| Section 25.14. | FURTHER ASSURANCES | 152 |
| Section 25.15. | SYSTEMS INTEGRATOR CERTIFICATIONS..... | 153 |
| | (A) General..... | 153 |
| | (B) Qualifications | 153 |
| | (C) Business Ethics and Fraud, Waste and Abuse Prevention | 153 |
| | (D) Collusion..... | 153 |
| | (E) Debarment..... | 153 |
| | (F) Tax Law Compliance | 153 |
| | (G) Bankruptcy, Judgments, Potential Structural Changes, Pending Legal Matters and Conflicts | 153 |
| | (H) PCI Compliance | 154 |
| | (I) Corporate and Business Filings and Reports | 154 |
| | (J) Employment Laws | 154 |
| | (K) Laws Prohibiting Discrimination..... | 154 |
| | (L) Northern Ireland Certification..... | 154 |
| | (M) Executive Orders..... | 154 |

TRANSACTION FORMS

| | |
|--------------------|--|
| TRANSACTION FORM A | FINANCIAL CLOSE SECURITY |
| TRANSACTION FORM B | LENDERS' REMEDIES AGREEMENT |
| TRANSACTION FORM C | MATERIAL CONTRACT DIRECT AGREEMENT |
| TRANSACTION FORM D | [RESERVED] |
| TRANSACTION FORM E | [RESERVED] |
| TRANSACTION FORM F | [RESERVED] |
| TRANSACTION FORM G | [RESERVED] |
| TRANSACTION FORM H | INDEPENDENT CERTIFIER AGREEMENT |
| TRANSACTION FORM I | FORM OF SI COUNSEL LEGAL OPINION |
| TRANSACTION FORM J | FORM OF MBTA COUNSEL LEGAL OPINION |
| TRANSACTION FORM K | [RESERVED] |
| TRANSACTION FORM L | FORM OF MBTA STANDARD NON-DISCLOSURE AGREEMENT |

APPENDICES

| | |
|-------------|---|
| APPENDIX 1 | DEFINITIONS |
| APPENDIX 2 | DESIGN AND IMPLEMENTATION REQUIREMENTS |
| APPENDIX 3 | SYSTEM FUNCTIONALITY REQUIREMENTS |
| APPENDIX 4 | OPERATIONS AND MAINTENANCE REQUIREMENTS |
| APPENDIX 5 | MILESTONE CONDITIONS |
| APPENDIX 6 | PROPOSAL EXTRACTS – TECHNICAL INFORMATION |
| APPENDIX 7 | MBTA REVIEW PROCEDURES |
| APPENDIX 8 | PAYMENT MECHANISM |
| APPENDIX 9 | HANDBACK REQUIREMENTS |
| APPENDIX 10 | KEY PERSONNEL AND PROJECT CONTRACTORS |
| APPENDIX 11 | UNIT RATES AND CHANGE IN COST METHODOLOGY |
| APPENDIX 12 | INSURANCE REQUIREMENTS |
| APPENDIX 13 | TERMINATION COMPENSATION |
| APPENDIX 14 | FINANCIAL CLOSE PROCEDURES AND CONDITIONS |
| APPENDIX 15 | PRELIMINARY FINANCIAL MODEL |
| APPENDIX 16 | DB DISPUTE REVIEW BOARD |

REFERENCE DOCUMENTS

| | |
|----------------------|----------------------------------|
| REFERENCE DOCUMENT 1 | LIST OF RFP BACKGROUND DOCUMENTS |
|----------------------|----------------------------------|

PROJECT AGREEMENT

FOR AUTOMATED FARE COLLECTIONS SYSTEM SERVICES

THIS PROJECT AGREEMENT FOR AUTOMATED FARE COLLECTIONS SYSTEM SERVICES is dated [_____, 2017] and made between the Massachusetts Bay Transportation Authority, a body politic and corporate and a political subdivision of the Commonwealth of Massachusetts with a principal place of business at 10 Park Plaza, Boston, Massachusetts 02116 (the “**MBTA**”), and [_____] a [_____] organized and existing under the laws of [_____] with an office at [_____] Boston, Massachusetts (the “**Systems Integrator**”).

RECITALS

WHEREAS, the MBTA is a political subdivision of the Commonwealth of Massachusetts (the “**Commonwealth**”), established under the provisions of M.G.L. c. 161A (the “**Act**”), and is responsible for providing public transportation services in certain areas of the Commonwealth; and

WHEREAS, the MBTA has determined to implement a new automated, account-based open fare collections system (the “**System**”) to serve the MBTA, with the capability of expansion to other transportation agencies, modes and services in order to make public transportation services a seamless network as viewed by travelers in the region; and

WHEREAS, the MBTA has determined that it is in its best interest to contract with a private entity to design, implement, install, integrate, test, finance, operate, maintain and manage the System; and

WHEREAS, pursuant to the Act, the MBTA issued a request for qualifications (RFQ) on July 18, 2016 to potential respondents interested in being included on a short-list of pre-qualified respondents that would be invited to submit price and technical proposals for the award of this Project Agreement; and

WHEREAS, in accordance with the requirements and evaluation criteria set forth in the RFQ, the MBTA selected four respondents (including the Systems Integrator) for inclusion on the short-list; and

WHEREAS, on November 15, 2016, the MBTA issued a request for proposals (RFP) to invite proposals for this Project Agreement; and

WHEREAS, [_____]

In consideration of the mutual covenants herein contained and other good and valuable consideration, the receipt and sufficiency of which are hereby expressly acknowledged, the Parties hereto, intending to be legally bound, covenant and agree as follows:

ARTICLE 1

DEFINITIONS AND INTERPRETATION

SECTION 1.1. DEFINITIONS.

As used in this Project Agreement, capitalized terms have the meanings assigned to them in Appendix 1 (Definitions).

SECTION 1.2. INTERPRETATION.

This Project Agreement shall be interpreted according to the following provisions, except to the extent the context or the express provisions of this Project Agreement otherwise require.

(A) Plurality. Words importing the singular number mean and include the plural number and vice versa.

(B) Persons. Words importing persons include individuals, legal personal representatives, firms, companies, associations, joint ventures, general partnerships, limited partnerships, limited liability partnerships, limited liability companies, trusts, business trusts, corporations, governmental bodies, and other legal entities.

(C) Headings. The table of contents and any headings preceding the text of the Articles, Sections and subsections of this Project Agreement shall be solely for convenience of reference and shall not affect its meaning, construction or effect.

(D) References Hereto. The terms “hereby,” “hereof,” “herein,” “hereunder” and any similar terms refer to this Project Agreement.

(E) References to Days and Time of Day. All references to days herein are references to calendar days, unless otherwise indicated, such as by reference to Business Days or Operating Days. Each reference to time of day is a reference to local time in Boston, Massachusetts.

(F) References to Including. The words “include”, “includes” and including” are to be construed as meaning “include without limitation”, “includes without limitation” and “including without limitation”, respectively.

(G) References to Statutes. Each reference to a statute or statutory provision includes any statute or statutory provision which amends, extends, consolidates or replaces the statute or statutory provision or which has been amended, extended, consolidated or replaced by the statute or statutory provision and includes any orders, regulations, by-laws, ordinances, codes of practice or instruments made under the relevant statute.

(H) References to Governmental Bodies. Each reference to a Governmental Body is deemed to include a reference to any successor to such Governmental Body or any organization or entity or organizations or entities which has or have taken over the functions or responsibilities of such Governmental Body.

(I) References to Documents and Standards. Each reference to an agreement, document, standard, principle or other instrument includes a reference to that agreement, document, standard, principle or instrument as amended, supplemented, substituted, novated or assigned.

(J) Industry Terms. Words and phrases that are not defined herein but that have well-known technical or industry meanings shall be construed pursuant to such recognized meanings, taking into account the context in which such words and phrases are used herein.

(K) References to MBTA-Specific Terms. Words which have a specific meaning for transit applications or within the MBTA shall have the meaning given to them in Fare Policy and other MBTA publications. Such terms include MBTA services and routes (such as Red Line, Mattapan Line, B-Branch, SL4, Commuter Rail, bus, Ferry and The RIDE), and MBTA properties (including Stations, Stops, garages, carhouses and facilities).

(L) References to Dollar Amounts. All statements of, or references to, dollar amounts or money, including references to “\$” and “dollars”, are to the lawful currency of the United States of America.

(M) References to All Reasonable Efforts. The expression “all reasonable efforts” and expressions of like import, when used in connection with an obligation of either Party, means taking in good faith and with due diligence all commercially reasonable steps to achieve the objective and to perform the obligation, including doing all that can reasonably be done in the circumstances taking into account each Party’s obligations hereunder to mitigate delays and additional costs to the other Party, and in any event taking no less steps and efforts than those that would be taken by a commercially reasonable and prudent person in comparable circumstances but where the whole of the benefit of the obligation and where all the results of taking such steps and efforts accrued solely to that person’s own benefit; provided that, the foregoing will not require the MBTA to:

(1) Take any action which is contrary to the public interest, as determined by the MBTA in its discretion; or

(2) Undertake action that might be available to the MBTA due to its status as a Governmental Body but that would not be available to a private, commercially reasonable and prudent person.

(N) Discretion. When a Party has “discretion”, it means that the Party has the sole, absolute and unfettered discretion, with no requirement to act reasonably or provide reasons unless specifically required under the provisions of this Project Agreement.

(O) References to Promptly. The word “promptly” is to be construed as meaning as soon as reasonably practicable in light of then-prevailing circumstances.

(P) Obligations to Provide Assistance. The obligations of a Party to cooperate with, to assist or to provide assistance to the other Party hereunder shall be construed as an obligation to use the Party’s personnel resources to the extent reasonably available in the context of performance of their normal duties, and not to incur material additional overtime or third-party expense unless requested and reimbursed by the assisted Party.

(Q) Party Bearing Cost of Performance. All obligations or responsibilities undertaken by each Party hereto shall be performed at the cost of the Party undertaking the obligation or responsibility, unless the other Party has expressly agreed herein to bear all or a portion of the cost, either directly, by reimbursement to the other party or through an adjustment to the Availability Payments.

(R) Entire Project Agreement. This Project Agreement contains the entire agreement between the Parties hereto with respect to the transactions contemplated by this Project Agreement.

Without limiting the generality of the foregoing, this Project Agreement shall completely and fully supersede all other understandings and agreements among the Parties with respect to such transactions, including the RFP and, except to the extent set forth in Appendix 6 (Proposal Extracts – Technical Information), the Proposal. This Project Agreement includes all provisions of the Appendices hereto, and references to Sections or Articles of the “the Project Agreement” in the Appendices are intended solely for convenience to refer to Sections or Articles included in the main body of this Project Agreement and shall not be construed to mean that the Appendices are not a part of this Project Agreement.

(S) Counterparts. This Project Agreement may be executed in any number of original counterparts. All such counterparts shall constitute but one and the same Project Agreement.

(T) Governing Law. This Project Agreement shall be governed by and construed in accordance with the applicable laws of the Commonwealth.

(U) Severability. Each provision of this Project Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Project Agreement is held to be invalid, unenforceable or illegal to any extent, such provision shall be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Project Agreement. If any such provision of this Project Agreement is held to be invalid, unenforceable or illegal, the Parties will promptly endeavor in good faith to negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Project Agreement as nearly as possible to its original intent and effect.

(V) Drafting Responsibility. The Parties waive the application of any rule of law which otherwise would be applicable in connection with the construction of this Project Agreement to the effect that ambiguous or conflicting terms or provisions should be construed against the Party who (or whose counsel) prepared the executed agreement or any earlier draft of the same.

(W) Interpolation. If any calculation hereunder is to be made by reference to a chart or table of values, and the reference calculation falls between two stated values, the calculation shall be made on the basis of linear interpolation.

(X) Accounting and Financial Terms. All accounting and financial terms used herein are, unless otherwise indicated, to be interpreted and applied in accordance with GAAP.

(Y) Applicability, Stringency and Consistency of Contract Standards. Where more than one Contract Standard applies to any particular performance obligation of the Systems Integrator hereunder, each such applicable Contract Standard shall be complied with. In the event there are different levels of stringency among such applicable Contract Standards, the most stringent of the applicable Contract Standards shall govern. In the event of any inconsistency among the Contract Standards, the Systems Integrator shall notify the MBTA, and the MBTA’s reasonable written determination as to the applicable standard shall be binding. Any reference in this Project Agreement to materials, equipment, systems or supplies (whether such references are in lists, notes, specifications, schedules, or otherwise) shall be construed to require the Systems Integrator to furnish the same, at minimum, in accordance with the grades and standards therefor indicated in this Project Agreement.

(Z) Third-Party Rights. This Project Agreement is exclusively for the benefit of the MBTA and the Systems Integrator and shall not provide any third parties (with the sole exceptions of the rights of any Indemnified Party as provided in Article 18 (Indemnification) and of the Lenders as provided in the Lenders’ Remedies Agreement) with any remedy, claim, liability, reimbursement, cause of action or other rights.

ARTICLE 2

REPRESENTATIONS AND WARRANTIES

SECTION 2.1. REPRESENTATIONS AND WARRANTIES OF THE MBTA. The MBTA represents and warrants, as of the Effective Date, that:

(A) Due Authorization. This Project Agreement has been duly authorized, executed and delivered by the MBTA, and constitutes a legal, valid and binding obligation of the MBTA, enforceable against the MBTA in accordance with its terms, except to the extent that its enforceability may be limited by bankruptcy, insolvency or other similar laws affecting creditors' rights from time to time in effect and equitable principles of general application.

(B) No Conflict. Neither the execution and delivery by the MBTA of this Project Agreement nor the performance by the MBTA of its obligations in connection with the transactions contemplated hereby or the fulfillment by the MBTA of the terms or conditions hereof:

(1) Conflicts with, violates or results in a breach of any constitution, law or governmental regulation applicable to the MBTA; or

(2) Conflicts with, violates or results in a material breach of any term or condition of any order, judgment or decree, or any contract, agreement or instrument, to which the MBTA is a party or by which the MBTA or any of its properties or assets are bound, or constitutes a material default under any of the foregoing.

(C) No Approvals Required. No approval, authorization, order or consent of, or declaration, registration or filing with, any Governmental Body or referendum of voters is required for the valid execution and delivery by the MBTA of this Project Agreement or the performance by the MBTA of its payment or other obligations hereunder, except as such have been duly obtained or made.

(D) No Litigation. There is no action, suit, proceeding, investigation or litigation before or by any Governmental Body pending or, to the best of its knowledge after due inquiry, overtly threatened or publicly announced against the MBTA, in which an unfavorable decision, ruling or finding could reasonably be expected to have a material and adverse effect on the execution and delivery of this Project Agreement by the MBTA or the validity, legality or enforceability of this Project Agreement against the MBTA, or any other agreement or instrument entered into by the MBTA in connection with the transactions contemplated hereby or on the ability of the MBTA to perform its obligations hereunder or under any such other agreement or instrument.

(E) No Other Representation or Warranty. Except as expressly provided in this Project Agreement, the MBTA makes no representations or warranties (and expressly disclaims any and all warranties not expressly set forth in this Project Agreement) whether express, implied, statutory, or otherwise, including any warranty of merchantability, fitness for a particular purpose, or non-infringement.

SECTION 2.2. REPRESENTATIONS AND WARRANTIES OF THE SYSTEMS INTEGRATOR. The Systems Integrator represents and warrants, as of the Effective Date, that:

(A) Existence and Powers. The Systems Integrator is a [_____] duly organized, validly existing and in good standing under the laws of [_____], and has the authority to do

business in the Commonwealth and in any other state in which it conducts its activities, with the full legal right, power and authority to enter into and perform its obligations under this Project Agreement.

(B) Due Authorization and Binding Obligation. This Project Agreement has been duly authorized, executed and delivered by all necessary action of the Systems Integrator and constitutes a legal, valid and binding obligation of the Systems Integrator, enforceable against the Systems Integrator in accordance with its terms, except to the extent that its enforceability may be limited by bankruptcy, insolvency or other similar laws affecting creditors' rights from time to time in effect and equitable principles of general application.

(C) No Conflict. Neither the execution nor delivery by the Systems Integrator of this Project Agreement nor the performance by the Systems Integrator of its obligations in connection with the transactions contemplated hereby or the fulfillment by the Systems Integrator of the terms or conditions hereof:

(1) Conflicts with, violates or results in a breach of any constitution, law, governmental regulation, by-laws or certificates of incorporation applicable to the Systems Integrator; or

(2) Conflicts with, violates or results in a breach of any order, judgment or decree, or any contract, agreement or instrument to which the Systems Integrator is a party or by which the Systems Integrator or any of its properties or assets are bound, or constitutes a default under any of the foregoing.

(D) No Approvals Required. No approval, authorization, order or consent of, or declaration, registration or filing with, any Governmental Body is required for the valid execution and delivery of this Project Agreement by the Systems Integrator, except as such have been duly obtained or made.

(E) No Litigation Affecting the Systems Integrator. There is no action, suit, proceeding, investigation or litigation, at law or in equity, before or by any court or Governmental Body pending or, to the best of its knowledge after due inquiry, overtly threatened or publicly announced against the Systems Integrator or any of its Affiliates, in which an unfavorable decision, ruling or finding could reasonably be expected to have a material and adverse effect on the execution and delivery of this Project Agreement by the Systems Integrator or the validity, legality or enforceability of this Project Agreement against the Systems Integrator, or any other agreement or instrument entered into by the Systems Integrator in connection with the transactions contemplated hereby, or on the ability of the Systems Integrator to perform its obligations hereunder or under any such other agreement or instrument.

(F) No Litigation Affecting the Project Contractors. To the best of its knowledge after due inquiry, there is no action, suit, proceeding, investigation or litigation, at law or in equity, before or by any court or Governmental Body pending or, to the best of the Systems Integrator's knowledge, overtly threatened or publicly announced against any Project Contractor, in which an unfavorable decision, ruling or finding could reasonably be expected to have a material and adverse effect on the execution and delivery of any Project Contract by the respective Project Contractor or the validity, legality or enforceability of any Project Contract against the Project Contractor that is party to the Project Contract, or on the ability of any Project Contractor to perform its obligations under its respective Project Contract.

(G) Intellectual Property. The Systems Integrator owns, or has express rights to use, all Intellectual Property necessary for the performance of its obligations under this Project Agreement,

including all Intellectual Property necessary for the DB Plans and Specifications, without any known material conflict with the rights of others.

(H) Information Supplied by the Systems Integrator. The information supplied and representations and warranties made by the Systems Integrator in all submittals made in response to the RFP and in all post-proposal submittals with respect to the Systems Integrator (and to the Systems Integrator's knowledge after due inquiry, all information supplied in such submittals with respect to the Project Contractors and Subcontractors) are true, correct and complete in all material respects.

(I) Systems Integrator Reviews. The Systems Integrator has carefully reviewed the whole of this Project Agreement and has taken all steps it considers reasonably necessary to satisfy itself that nothing contained herein inhibits or prevents the Systems Integrator from performing and completing the Contract Services in accordance with the Contract Standards.

(J) Compliance with Applicable Law Generally. The Systems Integrator is in compliance in all material respects with Applicable Law pertaining to the Systems Integrator's business and services.

(K) Representations as to the Financial Model. The Systems Integrator represents that the Financial Model:

- (1) Was prepared by or on behalf of the Systems Integrator in good faith;
- (2) Was audited and verified by an independent, recognized model auditor immediately prior to the Effective Date;
- (3) Fully discloses all cost, revenue and other financial assumptions and projections relevant to the Systems Integrator's performance of its obligations under this Project Agreement, it being understood that no assumption or projection that is not reflected in the Financial Model will be used to calculate or reflect the impact of any Compensation Event; and
- (4) Includes only formulas that are mathematically correct and suitable for making the projections referred to in item (3) of this representation.

ARTICLE 3

TERM

SECTION 3.1. EFFECTIVE DATE AND TERM.

(A) Initial Term. This Project Agreement shall become effective on the Effective Date and shall continue in effect for 13 years following the Financial Close Deadline (the “**Initial Term**”), subject to:

- (1) The MBTA’s rights to extend the effectiveness of this Project Agreement pursuant to Section 3.1(B);
- (2) Any Amendment entered into between the Parties pursuant to Section 3.1(C);
- (3) Any adjustment to the Initial Term pursuant to Section 13.5(F); and
- (4) The exercise by either Party of its early termination rights in accordance with Article 24 (Termination).

(B) Renewal Term. The MBTA shall have the right in its discretion to extend the effectiveness of this Project Agreement for up to two additional five-year periods (each a “**Renewal Term**”) in accordance with this Section 3.1(B). The MBTA, not later than the date scheduled for the First Handback Inspection pursuant to Article 9 (Handback Requirements), shall give the Systems Integrator written notice of its intent whether or not to exercise its renewal option. Such notice by the MBTA shall serve to extend the effectiveness of this Project Agreement by the applicable Renewal Term, commencing with the expiration of the Initial Term or the first Renewal Term, as applicable, and subject to:

- (1) Any adjustment to the Renewal Term pursuant to Section 13.5(F); and
- (2) The exercise by either Party of its early termination rights in accordance with Article 24 (Termination).

(C) Effect of MBTA Election. The exercise by the MBTA of its right to extend the effectiveness of this Project Agreement pursuant to Section 3.1(B) shall automatically serve to adjust the Expiration Date to be the last day of the applicable Renewal Term, and the Parties shall continue to be bound by all terms and conditions of this Project Agreement. Accordingly, in such event, the First Handback Inspection and Handback Period will occur during the applicable Renewal Term and not during the Initial Term or, if the MBTA subsequently exercises its right to extend the effectiveness of this Project Agreement pursuant to Section 3.1(B) during the first Renewal Term, the first Renewal Term. If the MBTA does not elect to extend the effectiveness of this Project Agreement pursuant to Section 3.1(B), the MBTA shall have the right, at any time prior to the Expiration Date, to request that the Systems Integrator agree to extend the effectiveness of this Project Agreement for a period not to exceed one Renewal Term on terms and conditions reasonably acceptable to the Systems Integrator and the MBTA, which terms and conditions shall be set forth in an Amendment.

(D) Accrued Rights. No termination or expiration of this Project Agreement shall:

- (1) Limit or otherwise affect the respective rights and obligations of the Parties hereto accrued prior to the date of such termination or expiration; or

(2) Preclude either Party from impleading the other Party in any Legal Proceeding originated by a third party as to any matter occurring during the Term.

SECTION 3.2. SURVIVAL. Notwithstanding any other provision of this Project Agreement, the following provisions hereof will survive the expiration or any earlier termination of this Project Agreement:

- (1) Each Party's representations and warranties made hereunder;
- (2) The Dispute Resolution Procedures;
- (3) The indemnifications, limitations and releases set forth in Article 18 (Indemnification);
- (4) The express obligations of the Parties hereunder following termination, including those set forth in Article 24 (Termination), Article 16 (Intellectual Property Rights), Section 5.6 and Section 17.4(G);
- (5) Sections 25.8 and 25.9;
- (6) Any other provisions which either expressly or by their context or inherent character should survive expiration or earlier termination of this Project Agreement or the completion of the Contract Services; and
- (7) Any provisions necessary to give effect to the provisions referenced or described in this Section 3.2.

SECTION 3.3. GRANT OF RIGHT.

Subject to the terms and conditions of this Project Agreement, the MBTA hereby grants to the Systems Integrator the exclusive right, and the Systems Integrator accepts such right and acknowledges its obligation, to (a) perform the Implementation Work and finance the Project, and (b) perform the Operating Services, in each case, in accordance with the terms of this Project Agreement. It is the express intent and agreement of the Parties that this Project Agreement shall in no way be deemed to constitute a lease to the Systems Integrator (whether an operating lease or a financing lease) or, except as expressly provided herein, a grant (regardless of the characterization of such grant, including by way of easement, purchase option, conveyance, lien or mortgage), in each case, of any right, title, interest or estate in the Project, the Locations, or of any assets incorporated into, appurtenant to, or in any way connected with the Project.

ARTICLE 4

FINANCING PERIOD

SECTION 4.1. FINANCIAL CLOSE.

(A) Financial Close Process. The Parties shall comply with their respective obligations for the achievement of Financial Close, as set forth in Appendix 14 (Financial Close Procedures and Conditions). Without limiting anything set forth in Appendix 14 (Financial Close Procedures and Conditions), Financial Close shall not occur until each of the Financial Close Conditions has been satisfied by the Systems Integrator or waived in writing by the MBTA in its discretion.

(B) Satisfaction Prior to Effective Date. The Parties acknowledge the potential simultaneous occurrence of the Effective Date and the Financial Close Date as the result of the satisfaction of the Financial Close Conditions by the Systems Integrator on or before the Effective Date. In such event, the provisions of this Article 4 (Financing Period) and of Appendix 14 (Financial Close Procedures and Conditions) shall have no applicability; provided that all work performed and Submittals provided under the Early Works Agreement shall be deemed to have been performed and provided under this Project Agreement and subject to all terms and conditions hereof.

SECTION 4.2. IMPLEMENTATION WORK DURING THE FINANCING PERIOD.

During the Financing Period, in addition to the performance of its obligations under Section 4.1, the Systems Integrator shall proceed with the Implementation Work in accordance with Article 6 (Implementation Work); provided that:

(1) The Installation Commencement Date may not occur prior to Financial Close;
and

(2) In the event of a termination of this Project Agreement due to a failure to achieve Financial Close prior to the Financial Close Deadline through no fault of the Systems Integrator, the Systems Integrator shall be entitled to compensation for the performance of such Implementation Work as and to the extent provided in Appendix 13 (Termination Compensation).

The Parties acknowledge and agree that all work performed and Submittals provided under the Early Works Agreement prior to the Effective Date shall be deemed to have been performed and provided under this Project Agreement and subject to all terms and conditions hereof.

SECTION 4.3. FINANCIAL CLOSE DEADLINE.

The “**Financial Close Deadline**” is the later of (a) 124 days following the Date of Award and (b) March 21, 2018, and may be extended due to the occurrence of Supervening Events, as and to the extent provided in Article 13 (Supervening Events), and as expressly provided in Appendix 14 (Financial Close Procedures and Conditions). The Parties shall execute a Contract Administration Memorandum as of the Financial Close Date to memorialize the Financial Close Deadline for purposes of the Expiration Date and the Key Milestones. The failure to achieve Financial Close by the Financial Close Deadline may result in termination of this Project Agreement, as and to the extent provided in Appendix 14 (Financial Close Procedures and Conditions).

SECTION 4.4. FINANCIAL CLOSE SECURITY.

(A) Requirements. On the Effective Date (subject to Section 4.1(B)), the Systems Integrator shall provide security for the performance of its obligations to achieve Financial Close by delivering to the MBTA one or more irrevocable direct pay letter(s) of credit meeting the requirements set forth in this Section 4.4(A) (the “**Financial Close Security**”). The Financial Close Security shall be:

- (1) Issued or confirmed by a Qualified Commercial Bank;
- (2) In substantially in the form set forth in the Transaction Forms and with an expiration date no earlier than 10 Business Days following the Financial Close Deadline, as such date may be extended pursuant to Section 4.3; and
- (3) In an aggregate amount equal to \$3,000,000.

(B) MBTA Drawing Rights. The MBTA shall have the right to draw upon the Financial Close Security in the full stated amount thereof solely under the circumstances specified in Appendix 14 (Financial Close Procedures and Conditions). The Parties acknowledge and agree that the MBTA’s rights to retain for its own account the proceeds of a drawing on the Financial Close Security under the circumstances specified in Appendix 14 (Financial Close Procedures and Conditions) are in the nature of liquidated damages and subject to the terms and conditions of Section 21.1(D).

(C) Return of Financial Close Security. The MBTA shall return the Financial Close Security to the Systems Integrator unless it has the right (including the contingent right) to draw on the Financial Close Security in accordance with Section 4.4(B).

ARTICLE 5

GENERAL REQUIREMENTS AND CONDITIONS

SECTION 5.1. CONTRACT STANDARDS.

(A) Generally. The Systems Integrator acknowledges and agrees that the Project will serve an essential public service and will be critically important to enable the MBTA to continue to meet its obligations in respect of the provision of Transportation Services. The Systems Integrator shall perform all Contract Services in accordance with the Contract Standards to further the interests of the MBTA and the Project.

(B) Application of Good Industry Practice. The Systems Integrator is responsible for keeping itself informed of and applying current Good Industry Practice at all times during the performance of the Contract Services throughout the Term.

SECTION 5.2. BACKGROUND INFORMATION AND INDEPENDENT DILIGENCE.

(A) Information Provided by or on Behalf of the MBTA. The Systems Integrator acknowledges and agrees that:

(1) Prior to the Proposal Submittal Date, the Reference Documents and certain other documents, information, reports and other materials relating to the Project (collectively, the **“Background Information”**) were made available in accordance with the RFP for the informational purposes of the competing firms, including the Systems Integrator;

(2) Prior to the Proposal Submittal Date, the Systems Integrator and each other Systems Integrator Person conducted their own due diligence as to the accuracy, completeness, relevance, fitness for purpose and adequacy of the Background Information;

(3) The Reference Documents have not been incorporated into this Project Agreement, either by their listing in the Table of Contents hereof or by any provision of this Project Agreement that requires the Systems Integrator to comply with a Reference Document or any part thereof;

(4) Neither the MBTA, nor any person who prepared, produced or provided any of the Background Information, makes or has made any representation, warranty, undertaking or guarantee as to the accuracy, completeness, relevance, fitness for purpose or adequacy of the Background Information;

(5) The Systems Integrator is not entitled to rely on any of the Background Information, except to the extent any Background Information is expressly stated as the basis for determining the occurrence of a Supervening Event hereunder; and

(6) Neither the MBTA nor any person who prepared, produced or provided any part of the Background Information shall have any responsibility or liability to the Systems Integrator or any other Systems Integrator Person in respect of, and, except as expressly provided hereunder in respect of Supervening Events, the Systems Integrator shall not be relieved of any obligation under this Project Agreement as a result of, any:

(a) Omission or lack of accuracy, utility, completeness, relevance, fitness for purpose or adequacy of any kind whatsoever in respect of the Background Information;

(b) Interpretations of, or conclusions drawn from, any of the Background Information;

(c) Failure by the MBTA or by any person who prepared, produced or provided any of the Background Information to update any of the Background Information, the contents of which may reflect information available as of the date such information was prepared or as of such other date indicated therein;

(d) Failure by the MBTA or any other person to reference or otherwise make available any materials, documents, drawings, plans or any other information relating to the Project; or

(e) Causes of action or claims of, or any losses whatsoever suffered by, the Systems Integrator or any other Systems Integrator Person by reason of any use of, or any action or forbearance in reliance on, any of the Background Information.

(B) Responsibility for Independent Diligence. The Systems Integrator acknowledges and agrees that it is responsible for the independent verification and confirmation of all information supplied to it by or on behalf of the MBTA and upon which it elects to rely in connection herewith. Subject to the terms of this Project Agreement, the Systems Integrator is deemed to have satisfied itself as to:

(1) The suitability of the Locations and the sufficiency of the rights granted to it under this Project Agreement for the performance of the Contract Services;

(2) The nature and extent of the risks assumed by it under this Project Agreement;

(3) The sufficiency of its opportunities and the opportunities of each other Systems Integrator Person to conduct due diligence prior to the Proposal Submittal Date pursuant to Good Industry Practice;

(4) The general, local, and physical conditions that may affect cost, progress, and the performance of the Contract Services; and

(5) The means, methods, techniques, sequences, and procedures to be employed by the Systems Integrator in order to perform the Contract Services in accordance with the Contract Standards.

(C) No Reliance on Unincorporated Statements or Representations. The Systems Integrator acknowledges and agrees that:

(1) It has not entered into this Project Agreement on the basis of, and has not relied upon, any statement, representation or warranty (in each case, whether oral, written, express or implied) made or agreed to by the MBTA or any other person, including any MBTA Person, except those expressly set forth in Section 2.1; and

(2) The only remedies available in respect of any untrue statement, misrepresentation or breach of warranty made to the Systems Integrator in this Project Agreement shall be those expressly set forth in this Project Agreement.

SECTION 5.3. RESPONSIBILITY FOR SYSTEMS INTEGRATOR PERSONS.

All obligations of the Systems Integrator hereunder shall be performed by Systems Integrator Persons (subject to the limitations established herein) who are qualified to perform the specific services and meet all licensing and certification requirements of Applicable Law. The Systems Integrator shall be fully responsible, in accordance with the terms and conditions of this Project Agreement, for all Contract Services performed by all Systems Integrator Persons, including the selection, pricing and performance of all Project Contractors and Subcontractors. The Systems Integrator shall, as between itself and the MBTA, be responsible and liable to the MBTA for, and not relieved of its obligations under this Project Agreement by, the acts, omissions, breaches, defaults, non-compliance, negligence, wilful misconduct or other legal fault of each Systems Integrator Person and all references in this Project Agreement to any act, omission, breach, default, non-compliance, negligence, wilful misconduct or other legal fault of the Systems Integrator will be construed accordingly to include any such act, omission, breach, default, non-compliance, negligence, wilful misconduct or other legal fault committed by any other Systems Integrator Person.

SECTION 5.4. ASSUMPTION OF RISK AND RESPONSIBILITY.

Except to the extent otherwise expressly set forth in this Project Agreement (including as the result of the occurrence of any Supervening Event), all risks, costs and expenses in relation to the performance by the Systems Integrator of the Contract Services are allocated to, and accepted by, the Systems Integrator as its entire and exclusive responsibility.

SECTION 5.5. COMPLIANCE WITH APPLICABLE LAW.

(A) Compliance Obligation. Without limiting any other requirement of this Project Agreement, the Systems Integrator shall, and shall cause all Systems Integrator Persons to, perform the Contract Services in accordance with Applicable Law.

(B) Governmental Approvals. The Systems Integrator shall, in accordance with the Contract Standards, make all filings, applications and reports necessary to be made in order to obtain and maintain all Governmental Approvals required for the performance of the Contract Services (other than DB Governmental Approvals) and shall obtain, maintain and comply with the terms of all such Governmental Approvals. The MBTA shall:

(1) Be responsible for obtaining, or causing the DB Entity to obtain, the DB Governmental Approvals, subject to the Systems Integrator's obligations under Section 6.5(D);

(2) Cooperate with and, upon the reasonable request of the Systems Integrator, provide reasonable assistance to the Systems Integrator in obtaining from Governmental Bodies the Governmental Approvals (including any modifications, renewals and extensions of existing Governmental Approvals from Governmental Bodies) required to be obtained by the Systems Integrator under this Section;

(3) Where necessary to obtain, renew, replace, extend the validity of, or arrange necessary amendments to any Governmental Approval and within a reasonable period of time after being requested to do so by the Systems Integrator:

- (a) Execute Governmental Approval application and related documents, either in its own name or jointly with the Systems Integrator, as and to the extent required under Applicable Law or the administrative practices of the applicable Governmental Body;
- (b) Provide for attendance by appropriate MBTA staff at public hearings and meetings of applicable Governmental Bodies; and
- (c) Provide the Systems Integrator with existing relevant data and documents that are within the MBTA's custody or control or are reasonably obtainable by the MBTA and which are reasonably required for such purpose.

To the extent Applicable Law or the administrative practice of the applicable Governmental Body requires that Governmental Approvals that are required to be obtained by the Systems Integrator pursuant to this Section be applied for or issued in the MBTA's name or that the MBTA directly coordinates with such Governmental Bodies, the Systems Integrator shall, at its own cost and expense, provide all necessary support and efforts to apply for and obtain such Governmental Approvals, including preparing all application and related documents for execution by the MBTA. The MBTA's obligation to assist and cooperate pursuant to this Section shall be subject to the Systems Integrator's obligations under this Section and shall not require the MBTA to:

- (4) Take a position which it believes to be inconsistent with this Project Agreement, Applicable Law, the requirements of Good Industry Practice, or MBTA policy (except policies that are incompatible with the contracting methodology associated with this Project Agreement or are inconsistent with the express obligations of the MBTA hereunder);
- (5) Take a position that is not usual and customary for the MBTA to take in addressing similar circumstances affecting its own projects (except for usual and customary arrangements that are incompatible with the contracting methodology associated with this Project Agreement or are inconsistent with the express obligations of the MBTA hereunder);
- (6) Refrain from concurring with a position taken by Governmental Body if the MBTA believes that position to be correct.

(C) Registration, Licensing and Certification Requirements. The Systems Integrator shall ensure that all Systems Integrator Persons performing the Contract Services, including the Project Contractors and all Subcontractors, comply with all registration, licensing and certification requirements imposed by Applicable Law.

(D) Investigations of Non-Compliance. In connection with any actual or alleged event of non-compliance with Applicable Law in the performance of the Contract Services, the Systems Integrator shall, in addition to any other duties which Applicable Law may impose:

- (1) Fully and promptly respond to all inquiries, investigations, inspections, and examinations undertaken by any Governmental Body;
- (2) Attend all meetings and hearings with respect to the Project required by any Governmental Body;
- (3) Provide to any Governmental Body (with copies to the MBTA) all corrective action plans, reports, submittals and documentation required by such Governmental Body; and

(4) Promptly upon receipt thereof, provide the MBTA with a true, correct and complete copy of any written notice of violation or non-compliance with Applicable Law, and true and accurate transcripts of any oral notice of non-compliance with Applicable Law, issued or given by any Governmental Body.

The Systems Integrator shall furnish the MBTA with a prompt written notice describing the occurrence of any event or the existence of any circumstance which does or may result in any such notice of violation or non-compliance to the extent the Systems Integrator has knowledge of any such event or circumstance, and of any Legal Proceeding alleging such non-compliance. To the extent practicable, the Systems Integrator shall provide the MBTA an opportunity to review and comment on any proposed Systems Integrator response to any non-compliance with Applicable Law hereunder prior to its implementing such response.

(E) Fines, Penalties and Remediation. In the event that any Systems Integrator Person fails at any time to comply with Applicable Law with respect to the Contract Services, the Systems Integrator shall:

- (1) Immediately correct such failure and resume compliance with Applicable Law;
- (2) Pay any resulting fines, assessments, levies, impositions, penalties or other charges;
- (3) Indemnify, defend and hold harmless the Indemnified Parties as and to the extent provided in Article 18 (Indemnification) from any Losses resulting therefrom;
- (4) Make all changes in performing the Contract Services which are necessary to assure that the failure of compliance with Applicable Law will not recur; and
- (5) Comply with any corrective action plan filed with or mandated by any Governmental Body in order to remedy a failure of the Systems Integrator Person to comply with Applicable Law.

SECTION 5.6. FINANCIAL BOOKS AND RECORDS.

(A) Recordkeeping Requirements. The Systems Integrator shall prepare and maintain proper, accurate, current and complete financial books and records regarding the Contract Services, including all books of account, bills, vouchers, invoices, personnel rate sheets, cost estimates and bid computations and analyses, Subcontracts, purchase orders, time books, daily job diaries and reports, correspondence, and any other documents showing all acts and transactions in connection with or relating to or arising by reason of the Contract Services, this Project Agreement, the Project Contracts, any Subcontract or any transactions in which the MBTA has or may have a financial or other material interest hereunder (collectively, the “**Books and Records**”), in each case, to the extent required to verify compliance with this Project Agreement or Applicable Law and to determine and substantiate the costs associated with any Compensation Event, including any Change in Costs and Financing Costs, and any Termination Amount. The Systems Integrator shall produce such financial books and records for examination and copying for such purposes promptly upon request by the MBTA and in a format that will enable an independent auditor to perform a review of the information in accordance with GAAP. Without limiting any requirement hereunder in respect of the Financial Model, the Systems Integrator shall not be required to provide the MBTA with any income statement showing profit and loss information, but recognizes that such information may become discernable to the MBTA through the process of substantiating costs associated with Compensation Events and any Termination Amount or otherwise

upon delivery of the Books and Records for the purposes specified in this Section. The Systems Integrator shall keep and maintain all Books and Records with respect to each Fiscal Year until at least the seventh anniversary of the last day of each such Fiscal Year, or such longer period during which any Legal Proceeding with respect to the Project may be pending. In the event the Systems Integrator fails to prepare, maintain or provide any Books and Records as required under this Section, the Systems Integrator shall not be entitled to any requested payments or adjustments to the extent such failure prevented verification or substantiation of costs, including any Change in Costs, as required by this Project Agreement.

(B) Inspection, Audit and Adjustment. The MBTA shall, with reasonable advance notice to the Systems Integrator and during normal Business Hours, have the right to perform or commission an inspection or independent audit of the financial information required to be kept under this Section for the purposes specified in Section 5.6(A). The MBTA shall have discretion as to the selection of the examiner or auditor and the scope of the inspection or audit, subject to the limitations set forth in this Section. If an inspection or audit reveals that the Systems Integrator has overstated any amount paid to the Systems Integrator hereunder, then the Systems Integrator shall, at the election of the MBTA, either immediately reimburse to the MBTA or offset against future Monthly Payments, the overstated amount plus interest at the Overdue Rate, from the time such amount was initially overpaid until reimbursed or credited to the MBTA. If the overpayment exceeds one percent (1%) of the total amount that should have been properly paid by the MBTA during the period audited and the Systems Integrator did not receive and provide the MBTA with an unqualified opinion from an independent auditor specifically identifying and supporting the amount initially invoiced or claimed by the Systems Integrator, then the Systems Integrator shall, in addition, reimburse the MBTA for any and all fees and costs incurred in connection with the inspection or audit. The foregoing remedies shall be in addition to any other remedies the MBTA may have, including remedies for a Systems Integrator Event of Default.

SECTION 5.7. DELIVERY OF DOCUMENTS.

(A) Systems Integrator. In this Project Agreement, the Systems Integrator is obligated to deliver reports, records, designs, plans, drawings, specifications, proposals and other documentary submittals in connection with the performance of its duties hereunder. The Systems Integrator agrees that all such documents shall be submitted to the MBTA in accordance with Appendix 7 (MBTA Review Procedures) or as otherwise specified in this Project Agreement and that the MBTA, acting reasonably, may require that such documents be provided in printed form. Digital copies of any such documents shall consist of computer readable data submitted in any standard interchange format which the MBTA may reasonably request to facilitate the administration and enforcement of this Project Agreement. In the event that a conflict exists between the signed or the signed and stamped hard copy of any document and the digital copy thereof, the signed or the signed and stamped hard copy shall govern.

(B) MBTA. Upon the reasonable request of the Systems Integrator, the MBTA shall make available to the Systems Integrator copies of all information relating to the Project which is in the possession of the MBTA and material to the Systems Integrator's performance hereunder, subject to Section 25.8 and to rights of attorney-client privilege. Nothing in this Section 5.7(B) shall be construed to obligate the MBTA to undertake any new studies or reports or to modify any information prior to making the same available to the Systems Integrator pursuant to this Section. The Systems Integrator acknowledges and agrees that any information provided by the MBTA pursuant to this Section shall be subject to the same terms and conditions as are set forth in Section 5.2 in respect of Background Information.

SECTION 5.8. BUSINESS RESTRICTIONS.

(A) No Other Business. The Systems Integrator shall not engage in any business or activity other than the business or activities conducted for the purpose of the Project or otherwise expressly permitted under this Project Agreement.

(B) Opportunities. Except as expressly provided herein, or as may be specifically agreed in writing between the MBTA and the Systems Integrator, the MBTA reserves the right to all commercial and other opportunities for, or related to, the Project. Without limiting the generality of the preceding sentence, the Systems Integrator acknowledges and agrees that, except as otherwise expressly provided herein or specifically agreed to in writing by the MBTA in its discretion, the Systems Integrator has no right to engage, directly or indirectly, in any revenue generating business or commercial opportunity in connection with the Project other than the performance of the Contract Services and the payments it receives from the MBTA pursuant to this Project Agreement. The Systems Integrator may propose any commercial or other opportunity for, or related to, the Project to the MBTA through an SI Change Request in accordance with the procedures set forth in Article 11 (Changes).

SECTION 5.9. CERTAIN NOTICES.

(A) Notice of Defect. If the Systems Integrator learns of any actual or reported defect in the System, or any problem associated with the results of the performance of the Contract Services, or of any nonconformance with a provision of this Project Agreement, the Systems Integrator shall promptly, and in any event within five Business Days after becoming aware of such defect, problem or nonconformance, notify the MBTA. Any such notification shall include a full description of the defect, problem, or nonconformance and the Systems Integrator's proposed remedial action.

(B) Notice of Default. The Systems Integrator shall provide to the MBTA, promptly following the receipt thereof, copies of any notice of default, breach or non-compliance received under or in connection with any Governmental Approval or Project Contract pertaining to the performance of the Contract Services.

SECTION 5.10. EMERGENCIES.

The Systems Integrator shall comply with all orders and directives given or issued by the MBTA or any Governmental Body having police power or regulatory jurisdiction based on any emergency condition. In the absence of any such order or directive, if an emergency occurs which threatens immediate loss or damage to property or safety of life, the Systems Integrator shall take all appropriate action to prevent threatened loss, damage, injury or death. The Systems Integrator shall notify the MBTA of the situation and all actions taken immediately thereafter.

SECTION 5.11. ACCESS TO MBTA PROPERTY AND OTHER LOCATIONS.

(A) SI Access Right. The execution of this Project Agreement shall be deemed to constitute the granting of a right to the Systems Integrator to access all Locations owned or controlled by the MBTA solely for the purposes of performing the Contract Services in accordance with the Contract Standards. The Systems Integrator acknowledges and agrees that such right is commensurate with the Systems Integrator's right to perform the Contract Services hereunder and subject to all restrictions set forth herein, including all access terms and conditions set forth in the Technical Requirements. The Systems Integrator may, for the same purposes (and subject to the same restrictions) described in this Section 5.11(A), grant to any Systems Integrator Person performing Contract Services on behalf of the Systems Integrator a corresponding right to access such Locations.

(B) Locations Not Owned or Controlled by the MBTA. The MBTA shall, at its own cost and expense, secure and grant to the Systems Integrator access rights in respect of any FVM Required Location that is not owned or controlled by the MBTA and any Location specifically identified in the DB Plans and Specifications in accordance with the Contract Standards (other than POS Required Locations or Distributed Locations) that is not owned or controlled by the MBTA, in each case, to the same extent and subject to the same restrictions as are established in respect of Locations owned or controlled by the MBTA pursuant to Section 5.11(A). The MBTA shall provide such grant by written notice to the Systems Integrator, specifying that the MBTA has secured such rights and that such Locations are available for the performance of the Contract Services, by no later than the date specified as the Installation Commencement Date in the Project Schedule most recently accepted by the MBTA. To the extent that the MBTA has rights of access thereto, and subject to the terms and conditions of a right of entry agreement satisfactory to the MBTA, the MBTA will use all reasonable efforts to arrange for early entry (prior to the Installation Commencement Date) to such Locations for the Systems Integrator for the purposes only of making surveys, inspections, examination, or other activities as may be approved by the MBTA, acting reasonably. The Systems Integrator shall provide at least seven days' prior written notice to the MBTA requesting any such early entry, stating the purpose, the applicable Location and the date on which entry is requested.

(C) Maintenance of Existing Operations. The Systems Integrator shall undertake and perform the Contract Services in a manner which does not interfere with or impair the ongoing operations of the MBTA or any MBTA Person in respect of the Transportation Network, except as expressly permitted in this Project Agreement. The Systems Integrator shall coordinate all Contract Services with the MBTA and all MBTA Persons in accordance with the Project Management Plans and the Contract Standards, including all applicable requirements specified in Appendix 2 (Design and Implementation Requirements) and Appendix 4 (Operations and Maintenance Requirements). If the Systems Integrator does not comply with the applicable Project Management Plans in respect of accessing and performing Contract Services at any Location, the MBTA shall have the right, by written notice to the Systems Integrator specifying the failure of compliance, to deny the Systems Integrator access to the Locations until such time as the Systems Integrator demonstrates to the reasonable satisfaction of the MBTA that it will correct the issue and resume compliance. A denial of access by the MBTA in accordance with this Section 5.11(C) shall not serve as a basis for Supervening Event relief hereunder.

(D) MBTA Cooperation Generally. Subject to the terms and conditions of this Section, including Section 5.11(C), the MBTA shall cooperate with the Systems Integrator to allow the Systems Integrator reasonable and timely access to Vehicles and the Locations for the performance of the Contract Services.

(E) Third Party Agreements. All property rights necessary to perform the Contract Services in respect of all Locations (other than Retail Reload Locations and SI Locations) shall be held or acquired, as applicable, in the name of the MBTA. The Systems Integrator shall not enter into any agreement with any Governmental Body, Utility, property owner or other third party having regulatory jurisdiction over any aspect of the Project or having any property interest affected by the Project that in any way purports to obligate the MBTA, or states or implies that the MBTA has an obligation, to the third party to carry out any installation, design, construction, maintenance, repair, operation, control, supervision, regulation or other activity during or after the end of the Term, unless the MBTA, in its discretion, otherwise approves the same in writing. The Systems Integrator has no power or authority to enter into any such agreement with a third party in the name or on behalf of the MBTA.

(F) POS Required Locations and Distributed Locations Generally. Subject to the terms and conditions of this Section, including Section 5.11(G), the Systems Integrator shall, at its own cost and expense, be solely responsible for:

(1) Compliance with all Applicable Law in relation to all POS Required Locations and Distributed Locations; and

(2) Obtaining, maintaining and complying with all Governmental Approvals and agreements with property owners in respect of POS Required Locations and Distributed Locations, including securing all access rights necessary for the performance of the Contract Services at the POS Required Locations and Distributed Locations.

(G) POS Required Locations and Distributed Locations – Fare Vending Machines. If the Systems Integrator elects to fulfill its obligations in respect of the Quantity Standards related to the POS Required Locations and Distributed Locations through the placement of Fare Vending Machines, the Systems Integrator shall submit to the MBTA in writing a request to acquire property rights necessary for the placement of such Fare Vending Machines (including the performance of all related DB Installation Work) and the continued performance of the Contract Services in respect of each such POS Required Location and proposed Distributed Location. The request shall include a drawing of the limits necessary for each such proposed Distributed Location and POS Required Location and an assessment of the suitability of each such proposed Distributed Location and POS Required Location for the placement of Fare Vending Machines, including the availability of necessary Utilities, a description of the site conditions (including any Regulated Conditions) and identification of all Governmental Approvals and agreements with property owners that are expected to be required. Any such request shall be subject to the approval of the MBTA, acting reasonably. Upon approval by the MBTA, the Systems Integrator shall undertake and complete the acquisition of such property rights in the MBTA's name, subject to Section 5.11(H). The MBTA shall approve any request pursuant to this Section 5.11(G) unless, in the MBTA's good faith judgment:

(1) To do so would materially adversely affect political, community or public relations;

(2) The proposed Distributed Location or POS Required Location is not suitable for the placement of Fare Vending Machines due to the existence of Regulated Conditions;

(3) Successful timely completion of the acquisition is not likely;

(4) The request does not provide sufficient information to enable the MBTA's evaluation; or

(5) There are other reasonable grounds for denying approval of the request that are consistent with Section 6 of Appendix 7 (MBTA Review Procedures).

The MBTA shall respond to any request pursuant to this Section 5.11(G) within 10 Business Days of its receipt of the request, which response shall indicate MBTA approval, specify the reasons for the MBTA's denial of approval, or, if the Systems Integrator has not provided all information required under this Section 5.11(G), request additional information. If the MBTA requests additional information, the MBTA shall subsequently respond in accordance with this Section 5.11(G) within five Business Days following its receipt of the requested information. Notwithstanding any of the foregoing, to the extent the MBTA owns or controls any POS Required Location upon which the Systems Integrator elects to place a Fare Vending Machine in accordance with the Contract Standards, the Systems Integrator shall have all rights as are specified in Section 5.11(A) in respect of such Location.

(H) MBTA Cooperation and Costs Related to POS Required Locations and Distributed Locations. The MBTA shall cooperate with, and provide reasonable assistance to, the

Systems Integrator in connection with the Systems Integrator's obligation to undertake and complete the acquisition of property rights in the MBTA's name pursuant to Section 5.11(G). Such cooperation and assistance shall be provided in accordance with the same terms and conditions and subject to the same limitations as are specified in Section 5.5(B) in respect of Governmental Approvals, it being understood that MBTA cooperation and assistance pursuant to this Section 5.11(H) shall extend to applicable property owners and Utility owners in addition to Governmental Bodies and that the MBTA will be required to execute agreements with property owners to the extent necessary to provide for property rights related to approved Distributed Locations and POS Required Locations in accordance with Section 5.11(G). The MBTA shall not be obligated to exercise its power of eminent domain in connection with the acquisition of any Location or otherwise under this Project Agreement. The Systems Integrator shall be responsible for all costs and expenses associated with the acquisition of property rights in the MBTA's name pursuant to Section 5.11(G), including costs and expenses incurred by the MBTA in providing assistance, but excluding those costs and expenses actually and properly incurred solely due to an MBTA Change. In paying all such costs and expenses, the Systems Integrator is not acquiring, and shall not be deemed to be acquiring, any interest in real property for the Systems Integrator. The MBTA may submit to the Systems Integrator, not more often than Monthly, invoices for costs and expenses incurred by the MBTA pursuant to this Section 5.11(H). The Systems Integrator shall reimburse the MBTA within 30 days of the MBTA's submittal to the Systems Integrator of each such invoice. Such costs may include costs of document preparation, attorneys' fees, and costs of permanent or temporary acquisition of leases, easements, rights of entry, licenses and other interests in real property.

(I) SI Locations. The Systems Integrator shall, at its own cost and expense, secure all property rights necessary for the Model Office, the AFC 1.0 Equipment storage facility required under Appendix 4.6 and, except as expressly provided in the Technical Requirements, all temporary work areas, lay down areas, staging areas, storage areas, stockpiling areas, equipment parking areas, and similar areas necessary for the performance of the Contract Services (collectively, the "**SI Locations**"). The MBTA shall not have any obligations or responsibilities with respect to the acquisition, maintenance or disposition of any rights or interests in any SI Location, and the Systems Integrator shall have no right or obligation to submit acquisition packages to the MBTA for, or obtain the MBTA's approval of the Systems Integrator's acquisition of, any such right or interest. The Systems Integrator shall comply with all Applicable Law in relation to all SI Locations and shall obtain, maintain and comply with all Governmental Approvals and agreements with property owners in respect of all SI Locations. Notwithstanding anything to the contrary set forth in Section 6.1(F), the Systems Integrator shall, subject to the terms of this Project Agreement, bear all risk of loss concerning any structures, improvements, fixtures, machinery, equipment or materials required for or in connection with the Contract Services and stored at any SI Location, including AFC 1.0 Equipment stored pursuant to Appendix 4.6. In addition, the Systems Integrator shall bear the risk of loss in respect of any spare parts or equipment that the Systems Integrator elects to store at any MBTA facility pursuant to Appendix 4.6.

ARTICLE 6

IMPLEMENTATION WORK

SECTION 6.1. IMPLEMENTATION WORK GENERALLY.

(A) Commencement and Prosecution of Implementation Work. On the Effective Date (subject to Section 4.2), the Systems Integrator shall promptly proceed to undertake, perform and complete the Implementation Work in accordance with the Contract Standards. Without limiting any other responsibility hereunder, the Systems Integrator shall perform the Implementation Work so as to provide the System such that on the Full Service Commencement Date the System:

- (1) Is a complete, commissioned, tested and fully operational automated, account-based open fare collections system that will enable Users to access and use the Transportation Services utilizing all Media in accordance with the Contract Standards;
- (2) Is in compliance with all Technical Requirements and Payment Industry Standards; and
- (3) Will enable the Systems Integrator to perform the Operating Services in accordance with the Contract Standards.

(B) Systems Integrator Control of the Implementation Work; No MBTA Responsibility. The Systems Integrator shall have total control of the Implementation Work and shall effectively direct and supervise the Implementation Work so that it is undertaken in compliance with the terms of this Project Agreement. Subject only to Supervening Event relief as and to the extent provided in this Project Agreement, the Systems Integrator has the sole and exclusive responsibility and liability for the Implementation Work and the performance of the System hereunder in accordance with the Contract Standards, notwithstanding any requirements or information included in the RFP or the MBTA's participation in the development, negotiation and finalization of this Project Agreement. Nothing in this Project Agreement shall be interpreted as giving any responsibility for the Implementation Work to the MBTA or any MBTA Person. The MBTA's rights of review, comment and approval with respect to any aspect of the Implementation Work shall be for the MBTA's benefit only, and no review comment or approval by the MBTA or any MBTA Person shall in any way relieve the Systems Integrator of its obligation for all aspects of the Implementation Work or the Project.

(C) General Obligations of the Systems Integrator. Without limiting any other requirement hereunder, the Systems Integrator shall, in accordance with the Contract Standards:

- (1) Furnish all design and other services, provide all materials, equipment and labor and undertake all efforts necessary or appropriate (excluding only those materials, services and efforts which this Project Agreement expressly specifies will be provided or undertaken by the MBTA or by persons other than Systems Integrator Persons) to perform the Implementation Work and maintain it during the Implementation Period so as to achieve each of the Key Milestones in accordance with the schedule requirements established hereunder;
- (2) Pay directly all costs and expenses of the Implementation Work of any kind or nature whatsoever, excluding only those costs and expenses which this Project Agreement expressly specifies will be the responsibility of the MBTA;

- (3) Submit all design documents, use cases, test cases, reports, submittals and other materials required by the Contract Standards in respect of the Implementation Work for review by the MBTA in accordance with Appendix 7 (MBTA Review Procedures) and ensure that no Implementation Work that is subject to, governed by or dependent upon any such deliverable proceeds prior to compliance with the applicable requirements specified in Appendix 7 (MBTA Review Procedures);
- (4) Develop, update, maintain and comply with all Project Management Plans that are required hereunder in respect of the Implementation Work;
- (5) Provide, and have full responsibility for, quality assurance and quality control of the Implementation Work, including development and compliance with the quality management plan;
- (6) Have exclusive responsibility for all means, methods, techniques, sequences, and procedures necessary or desirable for the correct, prompt, and orderly prosecution and completion of the Implementation Work;
- (7) Maintain safety and security, including information security, at all times during the performance of the Implementation Work;
- (8) Provide all training, including training of designated representatives of the MBTA, required by the Contract Standards;
- (9) Cooperate with the MBTA, the Independent Certifier and any Governmental Body concerning all matters relating to the Implementation Work;
- (10) Attend periodic meetings with the MBTA as required by the Contract Standards;
and
- (11) Use reasonable efforts to mitigate any delay and any damages due to delay regardless of the cause of the delay, including by re-sequencing, reallocating or redeploying the forces of any Systems Integrator Person performing Implementation Work to other Implementation Work, as appropriate.

(D) Project Schedule and Reports. The Systems Integrator shall prepare and provide the MBTA with the Project Schedule in accordance with Appendix 2 (Design and Implementation Requirements). Throughout the Implementation Period, the Systems Integrator shall submit to the MBTA a Monthly progress schedule and report, including updates to the Project Schedule, in accordance with the requirements of Appendix 2 (Design and Implementation Requirements). The Systems Integrator's submission of the Project Schedule, each Monthly progress schedule and report, and any revised progress schedule and report is for the MBTA's information only and shall not limit or otherwise affect the Systems Integrator's obligations hereunder to achieve the Key Milestones in accordance with the schedule requirements of this Project Agreement. Except as expressly provided in this Project Agreement in respect of the MBTA's acceptance of the Project Schedule, the MBTA's acceptance of any such submittal shall not bind the MBTA in any manner and shall not imply MBTA approval of, or consent to, any of the matters set forth therein. Notwithstanding any of the foregoing, the Systems Integrator acknowledges and agrees that it has a material obligation to provide the MBTA with, and to update, maintain and revise, the Project Schedule throughout the Implementation Period in accordance with the Contract Standards.

(E) Naming and Signs. The MBTA shall have the exclusive right to name the Project and any parts thereof. No signs shall be erected until their appearance, content, and location have been fully reviewed and approved by the MBTA, which approval shall not be unreasonably withheld or delayed.

(F) Title and Risk of Loss. Except as expressly provided herein (including in respect of Proprietary Intellectual Property), title to the structures, improvements, fixtures, machinery, equipment and materials constituting the System, including all System Elements, shall pass to and automatically vest in the MBTA upon incorporation in the Project, free and clear of all Liens other than Permitted Encumbrances. Notwithstanding the preceding sentence:

(1) The vesting of title to any part of any System Element shall not imply acceptance of such part by the MBTA as to compliance of such part with the requirements of this Project Agreement and shall not relieve the Systems Integrator of any of its obligations under this Project Agreement in respect of such part or otherwise; and

(2) The Systems Integrator shall, subject to the terms of this Project Agreement, bear all risk of loss or damage concerning such structures, improvements, fixtures, machinery, equipment and materials until the Full Service Commencement Date, regardless of the extent to which the loss or damage was insured or the availability of insurance proceeds.

For purposes of this Section 6.1(F), “incorporation in the Project” means, with respect to any Inspection Device, delivery thereof to the MBTA for use in connection with MBTA Activities, and, with respect to any part of any other System Element, affixing such part to any Location or Vehicle.

(G) Encumbrances. The Systems Integrator shall not directly or indirectly, without the MBTA’s consent, create or permit to be created or to remain, and shall promptly discharge or bond any Encumbrance arising on the System, the Locations or the Implementation Work (other than Permitted Encumbrances) arising out of the Systems Integrator’s performance of the Contract Services.

SECTION 6.2. SYSTEM DESIGN.

(A) Technical Requirements. The Technical Requirements include the basic design principles, concepts and performance requirements for the Implementation Work and the System but do not include the final, detailed design, plans or specifications or indicate or describe each and every item required for full performance of the Implementation Work or for achieving the Full Service Commencement Date. The Systems Integrator agrees to prepare and furnish all necessary detailed designs, plans, drawings and specifications for the performance of the Implementation Work in conformity with the Technical Requirements. The Systems Integrator further agrees that it shall not have the right to bring any claim whatsoever against the MBTA or any MBTA Person arising out of the Technical Requirements or any designs, plans, drawings, specifications or requirements included in the RFP or made available during the procurement process; provided that the foregoing is not intended to limit the right of the Systems Integrator to dispute any claim that it has failed to satisfy the Technical Requirements.

(B) Performance of System Design Work. Without limiting any other requirement hereunder, the Systems Integrator shall:

(1) Undertake, perform, and complete the designs and plans for the System, including all use cases and test cases, in accordance with the Contract Standards;

(2) Prepare all design documentation necessary or appropriate to carry out and complete the Implementation Work;

(3) Develop the design to include specific consideration of User Interface, operability, security, safety, maintenance, constructability and life cycle cost issues at all stages of design development, including consideration of secure, efficient and cost-effective operation and maintenance of the System;

(4) Comply with all requirements in respect of Design Review, as set forth in Appendix 7 (MBTA Review Procedures);

(5) Ensure that all working and final design documentation are in compliance with the Contract Standards and that the Implementation Work is performed to a standard of quality, integrity, durability and reliability which is equal to or better than the standard established by the Technical Requirements;

(6) Be responsible for the professional quality, technical accuracy, timely completion and coordination of all design documentation; and

(7) Without additional compensation, correct or revise any errors, omissions or other deficiencies in the design documentation.

(C) System Design Team. The Systems Integrator shall appoint a design team that:

(1) Is qualified to perform the design in accordance with the Contract Standards based on design experience with automated fare collections systems similar in scope, nature and complexity to the System;

(2) Includes (as required by Applicable Law or Good Industry Practice) professional engineers and architects licensed in the Commonwealth; and

(3) Has sufficient expertise and experience to perform the design in a proper and professional manner to achieve the standards established by the Contract Standards in accordance with the timelines required by this Project Agreement.

(D) Documents at the Model Office. The Systems Integrator shall maintain at the Model Office all design documents and plans for the performance of the Implementation Work, including all documents developed in accordance with this Section and a complete set of record drawings, in accordance with the Contract Standards. Such documents may be maintained in digital or physical form at the Model Office; provided that, the MBTA, acting reasonably, shall have the right to specify documents that must be maintained by the Systems Integrator at the Model Office in physical form. All documents required to be maintained under this Section shall be available to the MBTA and the Independent Certifier for reference, copying and use (in the case of the Independent Certifier, solely to the extent necessary for the Independent Certifier to perform the services specified in Section 6.8(D)), and a complete set thereof shall be delivered to the MBTA upon completion of the Implementation Work.

SECTION 6.3. REGULATED CONDITIONS.

(A) Existing Condition of Vehicles. The presence of asbestos on certain Vehicles has been disclosed to the Systems Integrator through the Background Information. Without limiting any other requirement hereunder, the Systems Integrator shall perform the Implementation Work, including

all related design and SI Installation Work, so as to avoid such disclosed asbestos such that the performance of the Implementation Work will not require any Response Action. The Systems Integrator shall be solely responsible for all cost, expense and delay resulting from any breach of its obligations under this Section 6.3(A).

(B) Additional Obligations. Without limiting anything under Section 6.3(A), in performing the Implementation Work, the Systems Integrator shall exercise due care, in light of all relevant facts and circumstances, to avoid exacerbating any Regulated Condition after the location and existence of such condition has been disclosed to the Systems Integrator or becomes actually known by the Systems Integrator through physical observation. Notwithstanding anything to the contrary in this Project Agreement, the Systems Integrator shall bear full responsibility for, and all cost and expense relating to, the handling, treatment, storage, removal, remediation, avoidance, or other appropriate action (if any), with respect to:

(1) Any Systems Integrator Hazardous Substance, including any Hazardous Substance present at, on, in or under, or migrating or emanating to or from any Location or Vehicle, that was generated, or brought or caused to be brought to any Location or Vehicle, by any act or omission of any Systems Integrator Person;

(2) The creation of any Regulated Condition due to Systems Integrator Fault or, if the location and existence of any Regulated Condition becomes actually known to the Systems Integrator, the exacerbation of such Regulated Condition due to Systems Integrator Fault; and

(3) Except as expressly provided below in this Section 6.3(B), any Regulated Condition at a POS Required Location or Distributed Location to the extent the same was known by the Systems Integrator prior to the Systems Integrator's designation of the POS Required Location or Distributed Location or could reasonably have been known, discovered, or observed by the Systems Integrator through the employment of procedures consistent with Good Industry Practice prior to the Systems Integrator's designation of the POS Required Location or Distributed Location.

No Regulated Condition for which the Systems Integrator bears responsibility under this Section shall constitute a Supervening Event. Without limiting Items (1) and (2) of this Section 6.3(B), the Systems Integrator shall not bear responsibility for a Regulated Condition specified in Item (3) of this Section 6.3(B) to the extent that the Systems Integrator specifically discloses such condition to the MBTA in designating the POS Required Location or Distributed Location, as applicable, and the MBTA expressly approves the applicable POS Required Location or Distributed Location, notwithstanding such disclosed Regulated Condition, pursuant to Section 5.11(G).

SECTION 6.4. SI INSTALLATION WORK.

(A) Scope of the SI Installation Work. Without limiting any other requirement hereunder, as part of the Implementation Work, the Systems Integrator shall be responsible for the following (together, the "**SI Installation Work**"):

- (1) The procurement, physical installation, commissioning and testing of System Elements on all Vehicles and at all Retail Reload Locations;
- (2) The removal of the Existing System from all Vehicles;
- (3) The preparation of the DB Plans and Specifications;

(4) The monitoring of, and coordination with, the DB Installation Work in accordance with Section 6.5; and

(5) The procurement, delivery, commissioning and performance testing of System Elements included in the DB Installation Work.

(B) Installation Commencement Date. Except to the extent permitted in Appendix 5.2, the Systems Integrator shall not permit any Systems Integrator Person to proceed with Installation prior to the Installation Commencement Date, as determined in accordance with Section 6.11(C).

(C) Vehicles. The Systems Integrator acknowledges and agrees that, pursuant to Section 5.11(D), the Systems Integrator will be provided with a limited period of time to access and perform SI Installation Work on each Vehicle and that the failure of the Systems Integrator to complete the Implementation Work in respect of each Vehicle in accordance with the Contract Standards, including the available period of performance, will interfere with MBTA Activities and cause damage to the MBTA. If the Systems Integrator fails to complete the SI Installation Work in respect of any Vehicle in accordance with the Contract Standards, including the available period of performance, such that any Vehicle that would otherwise be available is unavailable for MBTA Activities (as reasonably determined by the MBTA) upon the conclusion of the available period of performance of the applicable SI Installation Work, the MBTA shall notify the Systems Integrator and the Systems Integrator shall pay the MBTA, within 30 days following receipt of such notice, liquidated damages in the amount of:

(1) In the case of the unavailability of a Green Line Vehicle pursuant to this Section 6.4(C), \$7,500 per occurrence; and

(2) In the case of the unavailability of a Vehicle other than a Green Line Vehicle pursuant to this Section 6.4(C), \$2,500 per occurrence.

For purposes of this Section 6.4(C) and subject to the foregoing, an “occurrence” means (x) the unavailability of a Vehicle upon the conclusion of the available period of performance of the applicable SI Installation Work and (y) each subsequent day in which the applicable Vehicle remains unavailable at the scheduled time of commencement of MBTA Activities in respect of such Vehicle. The “available period of performance” means the period available to the Systems Integrator for the performance of SI Installation Work in respect of a Vehicle, as determined pursuant to the Technical Requirements and the applicable Project Management Plan. The Parties acknowledge and agree that the liquidated damages payable under this Section 6.4(C) are subject to the terms and conditions of Section 21.1(D).

(D) Retail Reload Locations. Subject to Sections 5.11(G) and 5.11(H), as between the Systems Integrator and the MBTA, the Systems Integrator shall be solely responsible for all Retail Reload Locations, including all agreements with property owners of Retail Reload Locations, pursuant to Section 5.11(F). Without limiting any requirement hereunder, the Systems Integrator shall perform any SI Installation Work at Retail Reload Locations in accordance with such terms and conditions as may be imposed by such property owners.

(E) SI Project Manager. The Systems Integrator shall designate an employee of the Systems Integrator, a Project Contractor, or an Affiliate of a Project Contractor to serve as the manager of the SI Installation Work (the “**SI Project Manager**”). The SI Project Manager or, subject to the prior written approval of the MBTA (acting reasonably) a designee thereof, shall be present at the Locations with any necessary assistants on a full-time basis when any Systems Integrator Person is performing SI Installation Work. Any person serving as the SI Project Manager, including any designee thereof, shall be appropriately trained, experienced and knowledgeable in all aspects of the Implementation Work so as

to knowledgeably interact and communicate with the MBTA, the DB Entity and all Project Contractors and Subcontractors regarding the Project and to appropriately oversee the day-to-day performance of the SI Installation Work. Any person serving as the SI Project Manager, including any designee thereof, shall, among other things:

- (1) Be familiar with the Implementation Work and all requirements of this Project Agreement;
- (2) Coordinate and give regular and careful attention and supervision to the SI Installation Work;
- (3) Maintain a daily status log of the SI Installation Work;
- (4) Attend all progress meetings with the MBTA during the Implementation Period;
- (5) Serve as the liaison between Systems Integrator Persons and MBTA Persons in respect of access to Locations during the Implementation Period and related matters;
- (6) Coordinate, where appropriate, with the Independent Certifier; and
- (7) Coordinate with the MBTA and the DB Entity in accordance with Section 6.5.

SECTION 6.5. DB INSTALLATION WORK.

(A) MBTA Responsibilities. The MBTA shall:

- (1) Perform, or cause the DB Entity to perform, all DB Installation Work in accordance with the DB Plans and Specifications and the schedule requirements specified in Section 6.5(H);
- (2) Pay directly all costs and expenses of the DB Installation Work of any kind or nature whatsoever, excluding only those costs and expenses which this Project Agreement expressly specifies will be the responsibility of the Systems Integrator pursuant to Section 6.5(I); and
- (3) Not permit the DB Entity or any person under contract with the MBTA or the DB Entity for the performance of the DB Installation Work (including subcontractors of any tier) to create any Encumbrance on the Project or on any Location that would have any material adverse effect on the Systems Integrator or the performance of the Contract Services.

(B) Systems Integrator Responsibilities Generally. The Systems Integrator's responsibilities hereunder include:

- (1) Preparing and finalizing the DB Plans and Specifications pursuant to Appendix 2.13 and promptly correcting any errors, omissions or other deficiencies in the DB Plans and Specifications;
- (2) Developing the Project Schedule and the applicable Project Management Plans to account for the performance of the DB Installation Work and the Systems Integrator's responsibilities hereunder;

(3) Attending regular meetings with the MBTA and the DB Entity to facilitate the coordination of the DB Installation Work and the Implementation Work; and

(4) Providing all information reasonably requested from the MBTA or the DB Entity concerning the System in order to facilitate the performance of the DB Installation Work in accordance with the DB Plans and Specifications.

(C) Changes to DB Plans and Specifications. Other than pursuant to an MBTA Change and without limiting anything under Section 6.5(H)(2), the DB Plans and Specifications may not be amended or modified without the prior written approval of the Systems Integrator, acting reasonably; provided that:

(1) Further design development necessary for the performance of the DB Installation Work will not be considered an amendment or modification to the DB Plans and Specifications to the extent such design development is consistent with the DB Plans and Specifications;

(2) The MBTA shall have the right to cause the DB Entity to perform work in respect of the Locations under the DB Contract in addition to the DB Installation Work, subject to the Systems Integrator's rights in respect of the Compensation Event described in Item (15)(e) of the definition thereof; and

(3) Notwithstanding anything to the contrary in this Project Agreement, the Systems Integrator shall not be obligated to approve any Fundamental DB Modification unless required pursuant to an MBTA Change.

(D) Systems Integrator Review of Submittals. As part of the DB Installation Work, the MBTA shall provide the Systems Integrator with all design and other submittals specified in the DB Plans and Specifications for review by the Systems Integrator. The Systems Integrator shall review each such submittal for compliance and consistency with the DB Plans and Specifications and shall provide written responses to each such submittal pursuant to Appendix 2.14.

(E) DB Governmental Approvals. The Systems Integrator shall use all reasonable efforts to provide assistance to the MBTA and the DB Entity in obtaining the DB Governmental Approvals and shall perform the Contract Services in compliance with all DB Governmental Approvals. The Systems Integrator's assistance to the MBTA and the DB Entity shall include:

(1) Supplying the MBTA and the DB Entity in a timely manner with all data and information regarding the System which may be required in order to obtain any DB Governmental Approval;

(2) Providing for attendance by appropriate Systems Integrator representatives at any meeting or hearing which may be required by any applicable Governmental Body;

(3) Responding to inquiries from any applicable Governmental Body in a timely manner and in coordination with the MBTA and the DB Entity; and

(4) Taking any other action reasonably necessary in accordance with Good Industry Practice to assist the MBTA and the DB Entity in obtaining DB Governmental Approvals.

(F) System Elements. The Systems Integrator shall, in accordance with the Contract Standards, supply all System Elements necessary for the performance of the DB Installation Work in a

manner consistent with the DB Plans and Specifications. The Systems Integrator may not charge the DB Entity for, or require the DB Entity to purchase from any Systems Integrator Person (or Affiliate), any System Element or any hardware, component, software, licenses, materials, equipment, tools, training, or services in connection with the performance of the DB Installation Work. The Systems Integrator shall be responsible for promptly correcting any defect in any System Element furnished in respect of the DB Installation Work, including by providing prompt replacement of defective System Elements, troubleshooting problems with System Elements and identifying solutions to prevent disruptions to Revenue Service caused by defective System Elements.

(G) Monitoring and Inspecting the DB Installation Work. Without limiting any requirement under Section 6.4(E), the Systems Integrator shall, in accordance with Good Industry Practice and all other applicable Contract Standards, monitor the performance of the DB Installation Work and, at each point specified in the DB Plans and Specifications or required by Good Industry Practice, perform a thorough inspection of the DB Installation Work. In the event the Systems Integrator at any time becomes aware of any noncompliance with the DB Plans and Specifications, the Systems Integrator shall promptly notify the DB Entity and the MBTA. Any such notification shall include a full description of the basis for the Systems Integrator's determination of noncompliance with the DB Plans and Specifications. If both Parties agree, or it is determined pursuant to the Dispute Resolution Procedures, that the applicable DB Installation Work is not in compliance with the DB Plans and Specifications, the MBTA shall correct, or cause the DB Entity to correct, any such failure of compliance.

(H) Schedule Requirements: Achievement of Substantial Completion. The Parties agree that:

(1) Time is of the essence in the achievement of each DB Completion Milestone, and the MBTA shall provide for the achievement of each of the DB Completion Milestones by the applicable DB Completion Date;

(2) Any update to the Project Schedule adjusting the scheduled completion date for a Key Milestone shall adjust the DB Completion Date relating to such Key Milestone to the same extent as the adjustment to the scheduled completion date for such Key Milestone; provided that, any such adjustment to a DB Completion Date shall be consistent with the schedule requirements of Appendix 2.13 and in no event may the Systems Integrator specify that any DB Completion Date be adjusted to a date earlier than the applicable DB Completion Date set forth in the Project Schedule first accepted by the MBTA under this Project Agreement absent the written approval of the MBTA in its discretion;

(3) The DB Plans and Specifications will define discrete phases of the DB Installation Work associated with each DB Completion Milestone (each a **“Defined Phase”**), along with the requirements for substantial completion for each such Defined Phase, and a Defined Phase may achieve substantial completion pursuant to the DB Plans and Specifications prior to the achievement of the applicable DB Completion Milestone;

(4) Substantial completion of each Defined Phase in respect of a DB Completion Milestone must be achieved pursuant to the DB Plans and Specifications in order to achieve the applicable DB Completion Milestone;

(5) The Systems Integrator shall, without limiting its rights in respect of any Compensation Event described in Item (10) of the definition thereof, provide written confirmation to the MBTA within 15 Business Days of the achievement of substantial completion of any Defined Phase;

(6) The date of achievement of substantial completion of any Defined Phase shall be the date of actual achievement of compliance with the applicable requirements of the DB Plans and Specifications, as determined by agreement of the Parties or pursuant to the Dispute Resolution Procedures; and

(7) Upon the achievement of substantial completion of any Defined Phase, the Systems Integrator shall assume responsibility for all System Elements included in the applicable Defined Phase in accordance with this Project Agreement; provided that, the MBTA shall remain responsible for:

(a) Completing, or causing the DB Entity to complete, all punch list items permitted by the DB Plans and Specifications to be outstanding as of substantial completion of the applicable Defined Phase;

(b) At the request of the Systems Integrator, enforcing claims in respect of any contractor warranty provided in connection with the performance of the applicable DB Installation Work; and

(c) Correcting, or causing the DB Entity to correct, any defects in the DB Implementation Work that:

(i) Could not reasonably be expected to have been discovered through appropriate due diligence in accordance with Good Industry Practice in light of the Systems Integrator's obligations under this Section 6.5; and

(ii) Are not caused by errors, omissions or other deficiencies in the DB Plans and Specifications (excluding errors caused by a Compensation Event described in Item (5) of the definition thereof) or any other Systems Integrator Fault.

(I) Systems Integrator Cost Responsibilities. Notwithstanding any of the foregoing, the Systems Integrator shall pay the MBTA all cost and expense reasonably incurred by the MBTA in connection with the performance of the DB Installation Work, including any increase in the price payable to the DB Entity for the performance of the DB Installation Work, solely to the extent such cost and expense results from any Systems Integrator Fault or, except to the extent otherwise required due to a Supervening Event, changes to the Implementation Work, the System or the DB Plans and Specifications that are initiated by the Systems Integrator or are required in order to correct any defect or deficiency in the DB Plans and Specifications or the System. Any such payment shall be due to the MBTA within 30 days following receipt by the Systems Integrator of an invoice therefor from the MBTA.

SECTION 6.6. MONITORING, OBSERVATIONS AND TESTING.

(A) Observation and Access. Throughout the Implementation Period, the Systems Integrator shall at all times afford the MBTA and its designated representatives every reasonable opportunity for observing all Implementation Work and shall provide the MBTA and its designated representatives with access to all SI Locations, including the Model Office in accordance with Appendix 2 (Design and Implementation Requirements). The Systems Integrator at all times shall coordinate and cooperate, and require its Project Contractors and all Subcontractors to coordinate and cooperate, with the MBTA and its designated representatives to facilitate the MBTA's activities under this Section. The Systems Integrator shall cause its representatives, including all Key Personnel, to be available at all reasonable times for consultation with the MBTA or its designated representatives.

(B) Systems Integrator Tests and Inspections. The Systems Integrator shall conduct all tests and inspections of the Implementation Work that are required by the Contract Standards, including all tests specified in the Technical Requirements. The Systems Integrator shall coordinate all testing and inspections with the MBTA and shall give the MBTA reasonable advance notice of tests or inspections prior to the conduct thereof; provided, however, that in no event shall any MBTA inability, failure or refusal to attend or be present at or during any such test or inspection delay the conduct thereof or the performance of the Implementation Work.

(C) MBTA Tests and Inspections. The MBTA and its designated representatives may at any reasonable time and with reasonable advance notice conduct, or require the Systems Integrator to conduct, such tests and inspections as the MBTA deems necessary or desirable to ascertain whether the Implementation Work complies with this Project Agreement; provided that, it shall be an MBTA Change if any such test or inspection is not required by the Technical Requirements unless any such test or inspection reveals a material failure of the Implementation Work to comply with this Project Agreement.

(D) Certificates and Reports. The Systems Integrator shall secure and deliver to the MBTA all certificates of inspection, test reports and approvals with respect to the Implementation Work as and when required by the Contract Standards.

(E) Independent Certifier. The Systems Integrator shall permit the Independent Certifier access to the Implementation Work and the Model Office to the extent necessary to perform the services specified in Section 6.8(D).

SECTION 6.7. CORRECTION OF IMPLEMENTATION WORK.

Without limiting any other obligation of the Systems Integrator hereunder, the Systems Integrator shall promptly take all action necessary to correct all Implementation Work that is not in compliance with the Contract Standards, whether discovered by the Systems Integrator or the MBTA, including, to the extent necessary, through the removal and replacement of System Elements and the re-engineering and re-testing of software. Nothing in this Section shall be construed to limit any right or remedy of the MBTA under Applicable Law or this Project Agreement in respect of any defect in the Implementation Work or the System.

SECTION 6.8. INDEPENDENT CERTIFIER.

(A) Generally. The MBTA and the Systems Integrator shall, promptly following the Effective Date, appoint a suitably qualified and experienced consultant (or firm of consultants) to perform the services specified in Section 6.8(D) (the “**Independent Certifier**”) for the purposes of this Project Agreement upon substantially the same terms as set forth in Transaction Form H. The Independent Certifier shall act impartially and independently of the MBTA and the Systems Integrator in the performance of its duties as contemplated in this Project Agreement and the Independent Certifier Agreement. Without limiting anything set forth in this Section, either Party may object to the appointment a consultant to serve as the Independent Certifier on the basis that the consultant is not financially independent of the other Party.

(B) Qualifications. The Independent Certifier shall be appropriately qualified to perform the role of the Independent Certifier hereunder and provide the services specified in Section 6.8(D), as determined by reference to Good Industry Practice and based on experience in the design and implementation of automated fare collections systems similar in scope, nature and complexity to the System. The qualifications described in this Section may be satisfied through a single consulting firm, a

joint venture among consulting firms or, with the approval of the Systems Integrator and the MBTA, a contractor and subcontractor relationship among consulting firms.

(C) Appointment and Replacement. If (i) within 20 Business Days following the Effective Date, the Independent Certifier has not been appointed; (ii) for any reason during the Implementation Period, the Independent Certifier is unable or unwilling to continue to perform the Independent Certifier services; (iii) the Independent Certifier's appointment has expired or been terminated by the MBTA and the Systems Integrator; or (iv) at any other time a determination or certification by the Independent Certifier is required and there is no current Independent Certifier Agreement, then:

(1) Within five Business Days following the date that is 20 Business Days after the Effective Date (or within five Business Days following the date of termination of the Independent Certifier's appointment, if applicable), the Systems Integrator shall provide a proposal from three candidates acceptable to the Systems Integrator for consideration by the MBTA, which proposal shall include the Independent Certifier's qualifications and estimated cost of performing the services;

(2) Within 10 Business Days following receipt of the candidate proposals, the MBTA shall notify the Systems Integrator of the candidates acceptable to the MBTA, and the Parties shall cooperate to enter into a contract with an acceptable candidate generally in the form set out as Transaction Form H; and

(3) If none of the candidates are acceptable to the MBTA, acting reasonably, or if for any reason an Independent Certifier is not appointed within 40 Business Days following the Effective Date (or within 20 Business Days following the date of termination of the Independent Certifier's appointment, if applicable), then the Parties shall proceed in accordance with the Dispute Resolution Procedures.

(D) Limitations. Nothing in this Project Agreement shall be interpreted as giving the Independent Certifier any responsibility or authority for any aspect of the Project, or as relieving the Systems Integrator of its responsibility for the Project as set out in this Project Agreement, and no Systems Integrator Person shall be entitled to rely on any advice or approvals that the Independent Certifier may give with respect to the Project. The Independent Certifier's sole responsibilities shall be to:

(1) Subject to Section 20.1, serve as the Mediator for purposes of Non-Binding Mediation prior to the Full Service Commencement Date in respect of disputes described in Section 6.10;

(2) Certify as to whether the Systems Integrator has satisfied the Criteria for Transition Period Completion and the Criteria for Full Service Commencement in accordance with Section 6.11;

(3) Perform all other services specified in the Independent Certifier Agreement, as mutually agreed to between the Parties.

SECTION 6.9. JOINT APPROVALS, COOPERATION AND COST RELATING TO INDEPENDENT CERTIFIER.

(A) Joint Approval Required. The MBTA and the Systems Integrator shall not, without the other's prior written approval, which approval shall not be unreasonably withheld or delayed:

- (1) Terminate, repudiate or discharge the Independent Certifier for any reason;
- (2) Waive, settle, compromise or otherwise prejudice any rights or claims which the other may have from time to time against the Independent Certifier;
- (3) Amend or vary the terms of the Independent Certifier Agreement or the services to be performed by the Independent Certifier; or
- (4) Enter into a separate agreement with the Independent Certifier in connection with the Project.

(B) Cooperation and Cost. The MBTA and the Systems Integrator shall cooperate with one another generally in relation to all matters within the scope of or in connection with the appointment of the Independent Certifier. All instructions and representations issued or made by either the MBTA or the Systems Integrator shall be simultaneously copied to the other and both the MBTA and the Systems Integrator shall be entitled to attend all inspections undertaken by, or meetings involving, the Independent Certifier; provided that, without limiting any right otherwise provided to the MBTA hereunder in respect of the Proprietary Intellectual Property, the Independent Certifier shall be provided access to Proprietary Intellectual Property to the extent necessary to perform inspections within the scope of the Independent Certifier's services, which access may, if requested by the Systems Integrator, be subject to commercially reasonable confidentiality restrictions to protect the confidentiality and proprietary nature of the Proprietary Intellectual Property. The costs of the Independent Certifier shall be paid in accordance with the Independent Certifier Agreement; provided that, the Systems Integrator shall not have any obligation to make any payment in respect of the Independent Certifier prior to the Financial Close Date.

SECTION 6.10. INDEPENDENT CERTIFIER AS MEDIATOR.

Prior to the Full Service Commencement Date, the Independent Certifier may (as agreed to between the Parties pursuant to Section 20.1(D)) serve as the Mediator for purposes of any Non-Binding Mediation with respect to any dispute that may arise between the Parties in respect of:

- (1) The interpretation of this Project Agreement as it relates to design development and Implementation Work matters generally, but excluding DB Disputes;
- (2) Compliance with the Key Performance Indicators during the Transition Period;
- (3) Whether the Systems Integrator has satisfied the Milestone Conditions applicable to any Key Milestone prior to the Transition Period Completion; and
- (4) The cost and time impact associated with any Supervening Event or proposed Change prior to the Full Service Commencement Date.

SECTION 6.11. COMPLETION SCHEDULE.

(A) Achievement of Milestones. The Parties agree that time is of the essence in the achievement of each of the Key Milestones. The Systems Integrator shall achieve each of the Key Milestones in accordance with the schedule requirements of this Project Agreement.

(B) Milestone Conditions. For each Key Milestone, the Systems Integrator shall provide the MBTA and the Independent Certifier with 30 days' advance written notice of the expected

date of satisfaction of all applicable Milestone Conditions set forth in Appendix 5 (Milestone Conditions). No Key Milestone shall be deemed to have been achieved unless:

(1) The MBTA has had the opportunity to review and respond to all reports and other deliverables required in respect of the applicable Milestone Conditions in accordance with the applicable procedures set forth in Appendix 7 (MBTA Review Procedures);

(2) Each of the applicable Milestone Conditions has been satisfied by the Systems Integrator or, in the MBTA's discretion, waived in writing by the MBTA; and

(3) Except in respect of the Installation Commencement Date and the Pilots, there exists no uncured Systems Integrator Event of Default or Remediable Breach of which the MBTA has provided notice hereunder, unless:

(a) Achievement of the applicable Key Milestone will effectuate its cure; or

(b) In the case of a Remediable Breach, the Systems Integrator is diligently pursuing its cure within the cure period available under Section 22.2.

(C) Installation Commencement Date. The MBTA shall issue a Notice to Proceed with Installation within five Business Days following achievement of the Criteria for Installation Commencement, as determined in accordance with Section 6.11(B). Upon issuance of such Notice to Proceed (the "**Installation Commencement Date**"), the Systems Integrator shall proceed with Installation in accordance with the Contract Standards.

(D) Pilots. The MBTA shall issue a Notice to Proceed with Pilot Phase 1 upon satisfaction of the criteria for commencement of Pilot Phase 1 and a Notice to Proceed with Pilot Phase 2 upon satisfaction of the criteria for commencement of Pilot Phase 2, in each case, as determined in accordance with Appendix 5.3 and Section 6.11(B). Upon successful completion of each Pilot, as determined in accordance with Appendix 5.3 and Section 6.11(B), the MBTA shall issue a written notice to the Systems Integrator confirming successful completion of such Pilot. Subject to Supervening Event relief as and to the extent provided under Article 13 (Supervening Events), if the time required to achieve successful completion of either Pilot is greater than 60 days from the date of the applicable Notice to Proceed, the Systems Integrator shall pay the MBTA on demand all reasonable cost and expense incurred by the MBTA in facilitating, monitoring and reviewing the results of such Pilot beyond such 60-day period.

(E) Revenue Service Commencement Date. The MBTA shall issue a Notice to Proceed with Operating Services not limited to Pilot participants within 10 Business Days following achievement of the Criteria for Revenue Service Commencement, as determined in accordance with and subject to Section 6.11(B), and upon issuance of such Notice to Proceed (the "**Revenue Service Commencement Date**"), the Systems Integrator shall commence performing such Operating Services; provided that:

(1) Without limiting the establishment of the Revenue Service Commencement Date hereunder or the MBTA's payment obligations in respect thereof, the MBTA shall have the right, in its discretion, to elect to delay the commencement of Operating Services not limited to Pilot participants by specifying a later date for the commencement of such Operating Services in such Notice to Proceed;

(2) If such later date is on or prior to 30 days following the Revenue Service Commencement Date:

(a) The period between the Revenue Service Commencement Date and the specified date for commencement of Operating Services not limited to Pilot participants shall be considered part of the Transition Period; and

(b) Such election shall not be considered an MBTA Change;

(3) Any election by the MBTA to delay the commencement of Operating Services not limited to Pilot participants by more than 30 days following the Revenue Service Commencement Date shall be considered an MBTA Change; and

(4) The MBTA shall not have the right to delay the commencement of Operating Services not limited to Pilot participants pursuant to this Section by more than 90 days following the Revenue Service Commencement Date.

(F) Transition Period Completion. Without limiting anything under Section 6.11(H) and subject to Section 6.11(B)(3), **“Transition Period Completion”** shall be deemed to have occurred upon the date certified by the Independent Certifier in the Transition Period Completion Certificate in accordance with this Section 6.11(F). If the Systems Integrator believes it has achieved the Criteria for Transition Period Completion, then the Systems Integrator may apply to the Independent Certifier for a Transition Period Completion Certificate. Any such application shall be delivered concurrently to the MBTA and shall be a certification by the Systems Integrator that it has achieved all Criteria for Transition Period Completion. No later than 15 Business Days after application by the Systems Integrator for the Transition Period Completion Certificate, the Independent Certifier shall review the basis for such application and:

(1) If the Independent Certifier determines that the Systems Integrator has satisfied all of the Criteria for Transition Period Completion, issue a certificate to the Systems Integrator and the MBTA indicating that the Criteria for Transition Period Completion has been achieved and specifying the date on which the Systems Integrator achieved Transition Period Completion, which date shall be no earlier than the date of its receipt of the Systems Integrator’s application (the **“Transition Period Completion Certificate”**); or

(2) If the Independent Certifier determines that the Systems Integrator has not satisfied all of the Criteria for Transition Period Completion, provide the Systems Integrator and the MBTA with a list of failures of compliance with the Criteria for Transition Period Completion and the corrective action that the Systems Integrator must take prior to issuance of a Transition Period Completion Certificate.

If the Independent Certifier determines that the Systems Integrator has not met the Criteria for Transition Period Completion and must take corrective action prior to the issuance of the Transition Period Completion Certificate, the Systems Integrator shall, at its sole cost and expense, take corrective action in accordance with the Contract Standards, satisfy all Criteria for Transition Period Completion and resubmit its application for the Transition Period Completion Certificate in accordance with this Section 6.11(F). The MBTA shall issue a Notice to Proceed with all Implementation Work relating to the physical removal of all AFC 1.0 Equipment required to support AFC 1.0 Media within five Business Days following issuance of the Transition Period Completion Certificate. Upon issuance of such Notice to Proceed, the Systems Integrator shall, subject to Section 6.12(B), proceed with such Implementation

Work and the completion of all other Implementation Work while continuing the performance of the Operating Services, all in accordance with the Contract Standards.

(G) Full Service Commencement Date. Without limiting anything under Section 6.11(H) and subject to Section 6.11(B)(3), the “**Full Service Commencement Date**” shall be the date certified by the Independent Certifier in the Full Service Commencement Certificate in accordance with this Section 6.11(G). If the Systems Integrator believes it has achieved the Criteria for Full Service Commencement, then the Systems Integrator may apply to the Independent Certifier for a Full Service Commencement Certificate. Any such application shall be delivered concurrently to the MBTA and shall be a certification by the Systems Integrator that it has achieved all Criteria for Full Service Commencement. No later than 15 Business Days after application by the Systems Integrator for the Full Service Commencement Certificate, the Independent Certifier shall review the basis for such application and:

(1) If the Independent Certifier determines that the Systems Integrator has satisfied all of the Criteria for Full Service Commencement, issue a certificate to the Systems Integrator and the MBTA indicating that the Criteria for Full Service Commencement has been achieved and specifying the date on which the Systems Integrator achieved all Criteria for Full Service Commencement, which shall be no earlier than the date of its receipt of the Systems Integrator’s application (the “**Full Service Commencement Certificate**”); or

(2) If the Independent Certifier determines that the Systems Integrator has not satisfied all of the Criteria for Full Service Commencement, provide the Systems Integrator and the MBTA with a list of failures of compliance with the Criteria for Full Service Commencement and the corrective action that the Systems Integrator must take prior to issuance of a Full Service Commencement Certificate.

If the Independent Certifier determines that the Systems Integrator has not met the Criteria for Full Service Commencement and must take corrective action prior to the issuance of the Full Service Commencement Certificate, the Systems Integrator shall, at its sole cost and expense, take corrective action in accordance with the Contract Standards, satisfy all Criteria for Full Service Commencement and resubmit its application for the Full Service Commencement Certificate in accordance with this Section 6.11(G).

(H) Effect of Issuance of Certificates. Subject to Section 6.11(B), the Transition Period Completion Certificate and the Full Service Commencement Certificate shall establish Transition Period Completion and the Full Service Commencement Date, respectively, and shall be final and binding on the Parties with respect to the occurrence of each such Key Milestone, as applicable, and the MBTA’s payment obligations in respect thereof. The issuance of such certificates by the Independent Certifier shall not limit the obligations of the Systems Integrator under this Project Agreement, including its obligation to complete any remaining Implementation Work and to remedy any defects, deficiencies or items of outstanding Implementation Work existing or discovered prior to or after the applicable Key Milestone, all in accordance with the Contract Standards. The MBTA shall retain all of its rights with respect to any matter not affected by the issuance of the Transition Period Completion Certificate and the Full Service Commencement Certificate, as applicable.

(I) Removal of Existing System Fareboxes. The Systems Integrator shall remove Existing System fareboxes from Vehicles in accordance with the Contract Standards, including the specific requirements specified in Appendix 2.12. The Systems Integrator acknowledges that its failure to remove any farebox from a Vehicle in accordance with the Contract Standards, including the deadline specified in Appendix 2.12, will interfere with MBTA Activities and cause damage to the MBTA, and

agrees, subject to Supervening Event relief as and to the extent provided hereunder, to pay the MBTA liquidated damages in the amount of:

- (1) \$50 per farebox that has not been removed in accordance with the Contract Standards as of the deadline specified in Appendix 2.12; and
- (2) \$50 per farebox that has not been removed in accordance with the Contract Standards as of the first day of each Month thereafter.

The Systems Integrator shall include any such liquidated damages as an itemized credit in the applicable Monthly Invoice. The Parties acknowledge and agree that the liquidated damages payable under this Section 6.11(I) are subject to the terms and conditions of Section 21.1(D).

SECTION 6.12. TRANSITION PERIOD.

(A) Purpose and Extension. During the Transition Period, the Systems Integrator shall, subject to Section 6.11(E), perform the Operating Services while the Existing System continues to operate in addition to performing all Implementation Work necessary to satisfy the Criteria for Transition Period Completion. The Parties agree that, without limiting anything in Section 6.11(E), the purpose of the Transition Period is to accommodate Users in transitioning to full System operations by enabling access to the Transportation Network through either the Existing System or the System during this period. The MBTA shall have the right to extend the Transition Period, notwithstanding the achievement of Transition Period Completion, by specifying a later date for the commencement of the Implementation Work specified in Section 6.11(F) in its Notice to Proceed; provided that:

- (1) Transition Period Completion shall nonetheless be established for purposes of the MBTA's obligations to begin making APC payments to the Systems Integrator pursuant to Appendix 8 (Payment Mechanism);
- (2) Any such extension shall be an MBTA Change; and
- (3) The MBTA shall not have the right to extend the Transition Period pursuant to this Section by more than 180 days following Transition Period Completion pursuant to this Section.

(B) Operations and Maintenance. Subject to Section 6.11(E) and without limiting any requirement hereunder in respect of the performance of Operating Services during the Pilots, the Systems Integrator shall be responsible for performing the Operating Services during the Transition Period in accordance with the Contract Standards and shall be subject to Deductions for failures of performance in accordance with Appendix 8 (Payment Mechanism). The MBTA shall operate and maintain the Existing System during the Transition Period; provided, that the Systems Integrator shall be responsible for:

- (1) Maintaining all System Elements in any Gates or AFC 1.0 Gates that contain both System Elements and AFC 1.0 Equipment; and
- (2) All other Technical Requirements in respect of the Transition Period.

(C) Periods Overlap. The Parties acknowledge and agree that the Implementation Period, the Transition Period and the Operating Period will overlap, and that during the period of overlap the obligations of the Systems Integrator to be performed during each such period shall apply.

ARTICLE 7

OPERATION AND MANAGEMENT OF THE SYSTEM

SECTION 7.1. OPERATING SERVICES GENERALLY.

(A) General Responsibilities. The Systems Integrator shall operate, maintain, repair, replace and manage the System on a 24-hour per day, seven-day per week basis throughout the Operating Period in order to collect Fares on behalf of the MBTA and enable Users to access and use the Transportation Services utilizing Media, all in accordance with the Contract Standards. Without limiting any other requirement hereunder, the Systems Integrator shall, in accordance with the Contract Standards:

(1) Furnish all services, provide all materials, equipment and labor and undertake all efforts necessary or appropriate (excluding only those materials, services and efforts which this Project Agreement expressly specifies will be provided or undertaken by the MBTA or by persons other than Systems Integrator Persons) to perform the Operating Services;

(2) Pay directly all costs and expenses of the Operating Services of any kind or nature whatsoever, excluding only those costs and expenses which this Project Agreement expressly specifies will be the responsibility of the MBTA;

(3) Submit all reports and documentation, and develop, update, maintain and comply with all Project Management Plans, that are required hereunder in respect of the Operating Services;

(4) Provide and assume full responsibility for the security, including information security, of the System in compliance with the Payment Industry Standards throughout the Term in respect of all System Elements and Data;

(5) Cooperate with the MBTA and any Governmental Body concerning all matters relating to the Operating Services; and

(6) Attend periodic meetings with the MBTA as required by the Contract Standards.

(B) Operating Services Manager. Without limiting any requirement under Section 9.1, the Systems Integrator shall appoint a full-time manager of the performance of the Operating Services (the “**Operating Services Manager**”) who shall be designated as Key Personnel and whose sole employment responsibility shall be the management of the day-to-day performance of the Operating Services. The Operating Services Manager shall be qualified to act in a liaison capacity with the MBTA and, subject to the prior written approval of the MBTA (acting reasonably), may appoint a qualified designee to assist in performing the responsibilities of the Operating Services Manager hereunder. The Operating Services Manager or approved designee shall:

(1) Be available at all reasonable times to respond to inquiries from the MBTA regarding the performance of the Operating Services; and

(2) Personally attend each required meeting with the MBTA concerning the Operating Services.

SECTION 7.2. MBTA FARE POLICY.

(A) MBTA Authority Generally. As between the Systems Integrator and the MBTA, the MBTA has the sole and exclusive authority over all MBTA Activities, including the establishment of transit service levels; Fare Policy and Products, including all Fares, Fare programs and exempt and discounted Users; periods of operation; transit routes; numbers of Vehicles and Stations; service areas; suspension of transit service and any suspension of collection of Fares. The Systems Integrator acknowledges and agrees that:

(1) It has no expectation of continuation of MBTA policy or action in respect of any of the foregoing, as existing or in effect as of the Effective Date or otherwise;

(2) The MBTA's policies and actions in respect of all of the foregoing are subject to change over the Term; and

(3) No change in MBTA policy or action in respect of any of the foregoing will constitute MBTA Fault or, except to the extent the same constitutes an MBTA Change, serve as a basis for Supervening Event relief or any additional compensation to the Systems Integrator.

(B) Implementation of Fare Policy. At all times during the Operating Period, the Systems Integrator shall, in accordance with the Contract Standards, including all applicable Technical Requirements and without limiting any other requirement hereunder:

(1) Subject to subsection (C) of this Section, implement, administer and effectuate all Fare Policy through the System;

(2) Ensure that all Fares are accurately calculated and applied by the System so that each User utilizing the System is charged the correct Fare for such User's access to and use of the Transportation Services, as determined in accordance with the Fare Policy in effect at the time of such access and use; and

(3) Collect and maintain all Fare Data for Account, Revenue Apportionment, reporting and MBTA audit purposes.

(C) Group Programs. The MBTA, or a Group Administrator, shall be responsible for the administration of any Group programs. The Systems Integrator shall provide support for such administration in accordance with the Contract Standards, including by providing all System functionality in accordance with Appendix 3 (System Functionality Requirements) and all services specified in Appendix 4 (Operations and Maintenance Requirements).

SECTION 7.3. FARE REVENUES.

(A) Property of the MBTA. All Fare Revenues shall be the property of the MBTA. To the extent any Fare Revenue is held at any time by any Systems Integrator Person, all such Fare Revenues shall be held in trust on behalf and for the account of the MBTA.

(B) Services and Deposit Account. During the performance of any Pilot and at all times during the Operating Period, the Systems Integrator shall, in accordance with the Contract Standards, including all requirements specified in Appendix 4 (Operations and Maintenance Requirements):

(1) Provide all cash handling, settlement, remittance, apportionment, reporting and reconciliation services in respect of all Fare Revenues; and

(2) Cause all Fare Revenues to be deposited in a deposit account designated from time to time in writing by the MBTA.

(C) Payment Service Providers. At all times during the Operating Period, the Systems Integrator shall have in place a written agreement with each Payment Service Provider (each such agreement a “**Merchant Agreement**”) and shall comply with all requirements specified in Appendix 4.7. The MBTA shall enter into agreements with Acquirers and American Express to the extent necessary to establish the MBTA as the “merchant of record” in respect of the applicable accounts described in Appendix 4.7; provided that:

(1) Except as may otherwise be agreed to by written agreement between the MBTA and the Systems Integrator in the MBTA’s discretion, the Systems Integrator shall be responsible for all performance and payment obligations of the MBTA under any such agreement;

(2) The terms and conditions of any such agreement with an Acquirer shall be subject to the approval of the MBTA, acting reasonably; and

(3) Without limiting the MBTA’s approval right under Item (2) of this Section 7.3(C)(2), the MBTA shall have no obligation to make any commitment to any Acquirer or other Payment Service Provider in respect of any payment processing services unrelated to the System.

SECTION 7.4. FARE CARDS AND FARE PRODUCTS.

(A) Systems Integrator Responsibilities. At all times during the Operating Period, the Systems Integrator shall, in accordance with the Contract Standards and without limiting any other requirement hereunder:

(1) Provide for the manufacture and supply of Fare Cards to satisfy the applicable Quantity Standard specified in Appendix 2 (Design and Implementation Requirements) and the order fulfillment requirements specified in Appendix 4 (Operations and Maintenance Requirements);

(2) Subject to Appendix 2.15, provide for and maintain all FVMs and Retail Reload Locations to satisfy the applicable quantity and accessibility standards specified in Appendix 2 (Design and Implementation Requirements) and to enable Users to purchase and reload Fare Cards and to purchase of all Products through FVMs and Retail Reload Locations;

(3) Provide for cash servicing of FVMs;

(4) Provide Users with the ability to order and reload Fare Cards and to purchase Products through all Sales Channels;

(5) Provide for the shipping and delivery of Fare Cards to satisfy all order fulfillment requirements specified in Appendix 4 (Operations and Maintenance Requirements); and

(6) Provide for all other customer service, collection, tracking and reporting services in respect of Fare Cards and Products that are specified in Appendix 4 (Operations and Maintenance Requirements).

(B) Purchase Prices. The prices payable by Customers in respect of Enablement Fees, Fares and Products shall be established from time to time by the MBTA in connection with its Fare Policy, and, except as expressly provided in Appendix 4.4, no Systems Integrator Person shall charge or collect from any User any amount in excess of such prices for any product or service in connection with the Project. All Enablement Fees and proceeds from the sale of Fares, Products and Value shall be considered Fare Revenues hereunder.

SECTION 7.5. OTHER USER-FACING SERVICES.

(A) Accounts. At all times during the Operating Period, the Systems Integrator shall provide for, maintain and manage Accounts through the System in accordance with the Contract Standards, including all requirements specified in Appendix 3 (System Functionality Requirements).

(B) System Website. At all times during the Operating Period, the Systems Integrator shall provide for, update and maintain the System Website in accordance with the Contract Standards, including all requirements specified in Appendix 3 (System Functionality Requirements).

(C) Customer Support Software. At all times during the Operating Period, the Systems Integrator shall provide for, update and maintain all Customer Support Software in accordance with the Contract Standards, including all requirements specified in Appendix 3 (System Functionality Requirements).

SECTION 7.6. INSPECTION DEVICES.

Inspection Devices are a part of the System but will be utilized by Inspection Device Users in connection with MBTA Activities, including Commuter Rail, Light Rail, Rapid Transit and bus inspections, and for Ferry validation. At all times during the Operating Period, the Systems Integrator shall provide and maintain Inspection Devices and all related spare parts and consumables in accordance with the Contract Standards, including the applicable Quantity Standard specified in Appendix 2 (Design and Implementation Requirements) and the service requirements specified in Appendix 4 (Operations and Maintenance Requirements).

SECTION 7.7. UTILITIES.

(A) Communications Network. The Systems Integrator shall provide the Communications Network as part of the System in accordance with the Contract Standards, including all requirements set forth in Appendix 2 (Design and Implementation Requirements).

(B) All Other Utilities. The Systems Integrator shall be permitted to utilize the MBTA-Provided Facilities at the cost and expense of the MBTA, as and to the extent provided in Appendix 4.6. Except as specifically provided in Appendix 4.6 in respect of the MBTA-Provided Facilities, the Systems Integrator shall have the responsibility to arrange for the supply of all Utilities necessary for the performance of the Operating Services and shall bear all cost and expense associated therewith.

SECTION 7.8. MBTA ACCESS RIGHTS; INSPECTIONS AND TESTING.

(A) Data. The MBTA shall have access to Data in accordance with all Technical Requirements.

(B) Observation and Access. Throughout the Operating Period, the Systems Integrator shall at all times afford the MBTA and its designated representatives every reasonable opportunity for observing the performance of the Operating Services and shall provide the MBTA and its designated representatives with access to all SI Locations, including the Model Office in accordance with Appendix 2 (Design and Implementation Requirements). The Systems Integrator at all times shall coordinate and cooperate, and require its Project Contractors and all Subcontractors to coordinate and cooperate, with the MBTA and its designated representatives to facilitate the MBTA's activities under this Section. The Systems Integrator shall cause its representatives, including all Key Personnel, to be available at all reasonable times for consultation with the MBTA or its designated representatives.

(C) Systems Integrator Tests and Inspections. The Systems Integrator shall conduct all tests and inspections of the System that are required by the Contract Standards during the Operating Period. The Systems Integrator shall coordinate all testing and inspections with the MBTA and shall give the MBTA reasonable advance notice of tests or inspections prior to the conduct thereof; provided, however, that in no event shall any MBTA inability, failure or refusal to attend or be present at or during any such test or inspection delay the conduct thereof or any performance of the Operating Services.

(D) MBTA Tests and Inspections. The MBTA and its designated representatives may at any reasonable time and with reasonable advance notice conduct, or require the Systems Integrator to conduct, such tests and inspections as the MBTA deems necessary or desirable to ascertain whether the System is in compliance with this Project Agreement; provided that, it shall be an MBTA Change if any such test or inspection is not required by the Technical Requirements unless any such test or inspection reveals a material failure of the System to comply with this Project Agreement.

(E) Certificates and Reports. The Systems Integrator shall secure and deliver to the MBTA all certificates of inspection, test reports and approvals with respect to the Operating Services as and when required by the Contract Standards.

SECTION 7.9. KEY PERFORMANCE INDICATORS.

(A) Monitoring and Reporting. Throughout the Operating Period, the Systems Integrator shall monitor and report on compliance with the Key Performance Indicators in accordance with Appendix 8 (Payment Mechanism).

(B) Failures of Compliance with Key Performance Indicators. Without limiting any other requirement under Appendix 8 (Payment Mechanism) or any other provision of this Project Agreement, in the event of a failure of compliance with any Key Performance Indicator, the Systems Integrator shall, subject to Supervening Event relief as and to the extent provided hereunder, promptly take all remedial action necessary to comply with such Key Performance Indicator, eliminate the cause of such failure of compliance and avoid or prevent the recurrence of such failure of compliance.

ARTICLE 8

MAINTENANCE, REPAIR, REPLACEMENT AND HANDBACK

SECTION 8.1. MAINTENANCE, REPAIR AND REPLACEMENT.

(A) Master Maintenance Plan. Without limiting any other obligation hereunder, the Systems Integrator shall prepare, update, maintain and comply with its obligations under the Master Maintenance Plan. The initial Master Maintenance Plan and each update thereof shall be in compliance with the requirements specified in Appendix 9 (Handback Requirements) and shall be subject to review, comment and acceptance by the MBTA in accordance with Appendix 7 (MBTA Review Procedures).

(B) Maintenance, Repair and Replacements. The Systems Integrator acknowledges and agrees that it has the sole and exclusive responsibility for ensuring that all System Elements are in compliance with the Technical Requirements and that each System Element will enable the Systems Integrator to perform the Operating Services in accordance with the Key Performance Indicators. Without limiting any other obligation hereunder, the Systems Integrator shall, in accordance with the Contract Standards, including all requirements specified in Appendix 4 (Operations and Maintenance Requirements):

- (1) Perform all maintenance and repair of the System Elements, including:
 - (a) All predictive, preventative and corrective maintenance; and
 - (b) All Software maintenance; and
- (2) Replace any System Element if required:
 - (a) By the Master Maintenance Plan or Appendix 4 (Operations and Maintenance Requirements);
 - (b) In order to maintain compliance with Payment Industry Standards; or
 - (c) In order to achieve compliance with the Key Performance Indicators or the Handback Requirements.

(C) Software Maintenance. The Systems Integrator's obligation to perform Software maintenance hereunder includes the obligation to:

- (1) Correct any errors or defects in Software;
- (2) Provide Software upgrades as and when required by the Contract Standards, including new versions, service packs, patches and other enhancements; and
- (3) Provide all documentation required under the Contract Standards in respect of any Software modification.

The Systems Integrator shall provide the MBTA with reasonable advance notice of any upgrade or modification to Software in accordance with Appendix 4 (Operations and Maintenance Requirements). In no event shall the Systems Integrator implement any Software upgrade or modification prior to

compliance with all applicable testing, quality assurance and reporting requirements established under the Contract Standards.

(D) Standards for Replacement of System Elements. In providing for any replacement of a System Element hereunder, the Systems Integrator shall, without limiting any other obligation hereunder, provide a replacement System Element that:

- (1) Is consistent with Good Industry Practice and fully compatible with the System at the time of the replacement;
- (2) Unless otherwise agreed to by the MBTA in accordance with Article 11 (Changes), meets all applicable Technical Requirements; and
- (3) Meets all requirements of Applicable Law and Payment Industry Standards, each as in effect at the time of the replacement.

(E) Performance of System Element Repair or Replacement Work. The Systems Integrator shall provide reasonable advance notice to the MBTA prior to repairing or replacing any System Element in accordance with this Section and shall coordinate with the MBTA as and to the extent required by Appendix 4 (Operations and Maintenance Requirements). If any repair or replacement of a System Element is reasonably expected to involve reconstruction, physical alteration, construction, remodeling, wiring or electrical services in respect of any MBTA station or any other public property (excluding Vehicles and Retail Reload Locations) that is determined to be material by the MBTA, then, unless otherwise agreed to by the MBTA in its discretion and without limiting any other requirement hereunder:

- (1) The Systems Integrator shall provide the MBTA with all plans, specifications and replacement System Elements necessary for the performance of such repair or replacement work in accordance with the Contract Standards;
- (2) Subject to Section 8.1(E)(3), the MBTA shall perform or cause the performance of such repair or replacement work in accordance with such plans and specifications and utilizing the replacement System Elements furnished by the Systems Integrator;
- (3) The Parties shall use reasonable efforts to agree on cost effective means of performing such repair or replacement work in accordance with Applicable Law, which may include providing for the performance of such work on a competitive, lowest responsible bid basis;
- (4) The Systems Integrator shall coordinate and monitor the performance of such repair and replacement work in accordance with the Contract Standards and shall have all rights and responsibilities in respect of such work as it has hereunder in respect of the DB Installation Work; and
- (5) The Systems Integrator shall pay the MBTA the reasonable cost and expense incurred by the MBTA in connection with the performance of such repair and replacement work, which payment shall be due to the MBTA within 30 days following receipt by the Systems Integrator of an invoice therefor from the MBTA.

SECTION 8.2. VANDALISM.

(A) Generally. If any maintenance, repair or replacement of any System Element is required due to Vandalism, the Systems Integrator shall perform such maintenance, repair or replacement in accordance with the Contract Standards. Subject to the foregoing and the express limitations set forth in the Technical Requirements, the occurrence of Vandalism shall constitute a Compensation Event. This Section is intended to provide for the Vandalism Reserve Account as a first resource for Change in Cost directly resulting from the occurrence of Vandalism and is not intended limit the Systems Integrator's rights to compensation and other relief in respect of Vandalism as a Compensation Event pursuant to Article 13 (Supervening Events).

(B) Vandalism Reserve Account. No later than the Installation Commencement Date, the Systems Integrator shall establish and fund a reserve account in the amount specified in Section 8.2(D) (the “**Vandalism Reserve Account**”) to be held and controlled by a Reserve Bank to be agreed between the Parties, acting reasonably. Within three Business Days of establishing the Vandalism Reserve Account, the Systems Integrator shall provide to the MBTA the details regarding the Vandalism Reserve Account, including the name, address and contact information for the Reserve Bank and the account number. The Parties agree that:

- (1) Withdrawals from the Vandalism Reserve Account will be controlled by the operation of an account control agreement to be agreed between the Parties, acting reasonably, and entered into by the Parties concurrently with the establishment of the Vandalism Reserve Account;
- (2) Any withdrawal from the Vandalism Reserve Account by the Systems Integrator will require the prior written approval of the MBTA, subject to Section 8.2(C); and
- (3) The Systems Integrator shall not be permitted to grant any security interest to any third party in relation to the Vandalism Reserve Account.

(C) Withdrawal of Amounts due to Vandalism. Subject to the approval of the MBTA in accordance with this Section 8.2(C), the Systems Integrator may withdraw funds from the Vandalism Reserve Account in such amounts and at such times as needed to pay amounts attributable to Change in Cost that have been incurred by the Systems Integrator in respect of maintenance, repair or replacement of any System Element that is required due to Vandalism, which costs shall be subject to all requirements specified in Appendix 11 (Unit Rates and Change in Cost Methodology). Prior to drawing funds from the Vandalism Reserve Account, the Systems Integrator shall provide the MBTA with written notice indicating the amount to be drawn, together with evidence of the costs that are the subject of such drawing; the purpose for which funds have been used; evidence that all Project Contractors and Subcontractors have waived any rights to Liens; and such other supporting information as the MBTA may reasonably require. Within 15 Business Days from the date of the receipt of such notice, the MBTA shall either approve or withhold its approval of the proposed withdrawal; provided that, the MBTA may only withhold its approval to a proposed withdrawal under this Section 8.2(C) if:

- (1) The Systems Integrator fails to provide the information required under this Section 8.2(C); or
- (2) The Systems Integrator is unable to demonstrate to the reasonable satisfaction of the MBTA that the proposed withdrawal amount:

(a) Will be used to meet Change in Costs incurred by the Systems Integrator in undertaking maintenance, repair or replacement of any System Element that is required due to the occurrence of Vandalism; and

(b) Is consistent with all terms and conditions specified in Appendix 11 (Unit Rates and Change in Cost Methodology).

(D) Vandalism Reserve Amount and Annual Adjustment. The “**Vandalism Reserve Amount**” shall be \$250,000, Index Linked and subject to pro rata adjustment, for each Fiscal Year commencing with the Fiscal Year in which the Installation Commencement Date occurs and ending with the Fiscal Year in which the Termination Date occurs. The initial Vandalism Reserve Amount to be funded by the Systems Integrator in accordance with Section 8.2(B) shall be adjusted on a pro rata basis, as applicable, to reflect the period commencing with the Installation Commencement Date and ending at the end of the applicable Fiscal Year. On each subsequent July 1st for the remainder of the Term, any amount remaining in the Vandalism Reserve Account that is not subject to an approved notice from the Systems Integrator pursuant to Section 8.2(C) shall be paid to the MBTA, and the Systems Integrator shall deposit an amount equal to the then applicable Vandalism Reserve Amount into the Vandalism Reserve Account. On the Termination Date, the MBTA shall be paid any amount remaining in the Vandalism Reserve Account that is not subject to an approved notice from the Systems Integrator pursuant to Section 8.2(C).

(E) Accrued Interest. Any interest that accrues on amounts standing to the credit of the Vandalism Reserve Account shall only be withdrawn at the time other amounts are being withdrawn therefrom and subject to the terms and conditions of this Section.

(F) MBTA Cost Responsibility for Vandalism. Subject to Article 13 (Supervening Events), the MBTA shall be responsible for:

(1) The payment of any Financing Costs, as well as any amount payable pursuant to Section 13.6, to the extent required to be paid due to the occurrence of Vandalism occurring prior to the Full Service Commencement Date; and

(2) Any Change in Cost incurred by the Systems Integrator in respect of maintenance, repair or replacement of any System Element that is required due to Vandalism to the extent such Change in Cost exceeds the amount available or that should be available in the Vandalism Reserve Account in accordance with this Section.

SECTION 8.3. MAINTENANCE INSPECTIONS AND ASSESSMENTS.

The Systems Integrator, the MBTA and the Independent Evaluator shall conduct Joint Technical Reviews as and to the extent required under Appendix 8 (Payment Mechanism). In addition, the MBTA may at any time perform a limited or full-scale inspection and review of the state of repair, working condition and performance capability of the System, including testing of System Elements to determine their physical and operational condition. Any such inspection and review by the MBTA shall be subject to Section 7.8(D), and shall take place at such time as the MBTA shall determine upon reasonable notice to the Systems Integrator. The inspection may include a concurrent review of all relevant data, records and reports. The Systems Integrator shall cooperate fully with any such inspection, which shall not interfere unreasonably with the Systems Integrator’s performance of the Operating Services.

SECTION 8.4. HANDBACK REQUIREMENTS AND RESERVE ACCOUNT.

(A) **Required Condition.** On the Expiration Date, the System, including each System Element, shall be in the condition required by the Handback Requirements.

(B) **Reserve Account.** No later than 40 Business Days prior to the first day of the Handback Period, the Systems Integrator shall establish a reserve account (the “**Handback Reserve Account**”) to be held and controlled by a Reserve Bank to be agreed between the Parties, acting reasonably. Within three Business Days of establishing the Handback Reserve Account, the Systems Integrator shall provide to the MBTA the details regarding the Handback Reserve Account, including the name, address and contact information for the Reserve Bank and the account number. The Parties agree that:

(1) Withdrawals from the Handback Reserve Account will be controlled by the operation of an account control agreement to be agreed between the Parties, acting reasonably, and entered into by the Parties no later than the first Business Day of the Handback Period;

(2) Any withdrawal from the Handback Reserve Account by the Systems Integrator will require the prior written approval of the MBTA, subject to Section 8.5(D); and

(3) The Systems Integrator shall not be permitted to grant any security interest to any third party in relation to the Handback Reserve Account or any amounts standing to the credit of the Handback Reserve Account.

SECTION 8.5. FUNDING AND WITHDRAWAL.

(A) **Handback Reserve Amount.** Within 45 days following the MBTA’s receipt of the Handback Inspection Report relating to the First Handback Inspection, as required in accordance with Appendix 9 (Handback Requirements), the Parties, acting reasonably, shall seek to agree upon the amount reasonably necessary for the Systems Integrator to perform all Handback Work (the “**First Handback Reserve Amount**”), and in the absence of agreement and until such time as a final amount may be determined pursuant to the Dispute Resolution Procedures, the First Handback Reserve Amount shall be equal to the amount determined by the Independent Handback Consultant. Within 45 days following the MBTA’s receipt of the Handback Inspection Report relating to the second Handback Inspection, as required in accordance with Appendix 9 (Handback Requirements), the Parties, acting reasonably, shall seek to agree upon the amount reasonably necessary for the Systems Integrator to perform all remaining Handback Work (the “**Second Handback Reserve Amount**”), and in the absence of agreement and until such time as a final amount may be determined pursuant to the Dispute Resolution Procedures, the Second Handback Reserve Amount shall be equal to the amount determined by the Independent Handback Consultant; provided that, in no event shall the Second Handback Reserve Amount be less than twenty-five percent (25%) of the First Handback Reserve Amount.

(B) **Funding.** Subject to Section 8.6, the Systems Integrator shall fund the Handback Reserve Account:

(1) In the amount of the First Handback Reserve Amount, as determined in accordance with Section 8.5(A), no later than the first day of the Handback Period; and

(2) In the amount of the Second Handback Reserve Amount, as determined in accordance with Section 8.5(A), no later than the date that is 12 months prior to the Expiration Date.

(C) Deductions from Monthly Payments. To the extent that the balance standing to the credit of the Handback Reserve Account is not at least equal to the First Handback Reserve Amount on the date required under Section 8.5(B)(1), the MBTA shall, until such time as the balance standing to the credit of the Handback Reserve Account is equal to the First Handback Reserve Amount, make deductions from subsequent Monthly Payments, and pay such amounts into the Handback Reserve Account. To the extent that the balance standing to the credit of the Handback Reserve Account is not at least equal to the Second Handback Reserve Amount on the date required under Section 8.5(B)(2), the MBTA shall, until such time as the balance standing to the credit of the Handback Reserve Account is equal to the Second Handback Reserve Amount, make deductions from subsequent Monthly Payments, and pay such amounts into the Handback Reserve Account.

(D) Withdrawals Prior to Termination Date. Subject to the approval of the MBTA in accordance with this Section 8.5(D), the Systems Integrator may withdraw funds from the Handback Reserve Account in such amounts and at such times as needed to pay amounts reasonably incurred by the Systems Integrator in performing or causing the performance of Handback Work that was taken into account in the calculation of the applicable Handback Reserve Amount; provided that, the aggregate amount drawn from the Handback Reserve Account by the Systems Integrator pursuant to this Section 8.5(D) shall not at any time exceed seventy-five percent (75%) of the First Handback Reserve Amount. Prior to drawing funds from the Handback Reserve Account, the Systems Integrator shall provide the MBTA with written notice indicating the amount to be drawn, together with evidence of the costs that are the subject of such drawing; the purpose for which funds have been used; evidence that all Project Contractors and Subcontractors have waived any rights to Liens; and such other supporting information as the MBTA may reasonably require. Within 15 Business Days from the date of the receipt of such notice, the MBTA shall either approve or withhold its approval of the proposed withdrawal; provided that, the MBTA may only withhold its approval to a proposed withdrawal under this Section 8.5(D) if:

- (1) The Systems Integrator fails to provide the information required under this Section 8.5(D);
- (2) The Systems Integrator is unable to demonstrate to the reasonable satisfaction of the MBTA that the proposed withdrawal amount will be used to meet costs reasonably incurred by the Systems Integrator in performing or causing the performance of Handback Work that was taken into account in the calculation of the applicable Handback Reserve Amount; or
- (3) The withdrawal would result in the amount standing to the credit of the Handback Reserve Account to be less than twenty-five percent (25%) of the First Handback Reserve Amount.

(E) Withdrawal in Connection with Expiration. Promptly following issuance of a Handback Certificate by the MBTA in accordance with Appendix 9 (Handback Requirements), the amount standing to the credit of the Handback Reserve Account shall be withdrawn as follows:

- (1) If the Handback Certificate certifies that any Handback Requirement has not been met, in the following order of priority:
 - (a) First, an amount equal to the cost of the work necessary to provide for compliance with the Handback Requirements shall be paid to the MBTA; and
 - (b) Second, any remaining balance shall be paid to the Systems Integrator; and

(2) If the Handback Certificate certifies that all Handback Requirements have been met, the full balance standing to the credit of the Handback Reserve Account shall be paid to the Systems Integrator.

(F) Termination Prior to Expiration. If the Termination Date occurs prior to the Expiration Date, the amount standing to the credit of the Handback Reserve Account shall be withdrawn and paid to the MBTA; provided that, any amount payable to the Systems Integrator in respect of the Handback Reserve Account balance pursuant to Appendix 13 (Termination Compensation) shall be withdrawn and paid to the Systems Integrator and credited against the MBTA's payment obligation in respect thereof.

(G) Accrued Interest. Any interest that accrues on amounts standing to the credit of the Handback Reserve Account shall only be withdrawn at the time other amounts are being withdrawn therefrom and subject to the terms and conditions of this Section.

SECTION 8.6. HANDBACK LETTER OF CREDIT.

(A) Systems Integrator Right. In lieu of the funding of the Handback Reserve Account in accordance with Section 8.5(B), the Systems Integrator may, in its discretion, deliver to the MBTA one or more letters of credit (collectively the "**Handback Letter of Credit**") from a Reserve Bank, each in a form reasonably acceptable to the MBTA and on the basis that the MBTA shall be the sole beneficiary, with aggregate value equal to the applicable Handback Reserve Amount, whereupon (to the extent that the Handback Reserve Account has already been funded) all amounts standing to the credit of the Handback Reserve Account shall be paid to the Systems Integrator; provided that, notwithstanding such delivery by the Systems Integrator, the Systems Integrator shall nonetheless be required to establish (but not fund) the Handback Reserve Account in accordance with Section 8.5(A). The Systems Integrator shall be entitled to adjust the value of the Handback Letter of Credit on the date it would otherwise be required to fund the Second Handback Reserve Amount pursuant to Section 8.5(B)(2) if the amount of the Handback Letter of Credit immediately prior to such date is in excess of the Second Handback Reserve Amount; provided that, at no time may the Handback Letter of Credit be in an amount less than the applicable Handback Reserve Amount.

(B) MBTA Drawing Rights. The MBTA shall have the right to draw on the Handback Letter of Credit:

(1) Under any circumstance where, had the Systems Integrator not elected to deliver a Handback Letter of Credit pursuant to this Section 8.6, the MBTA would have been entitled to payment of a portion of the amounts standing to the credit of the Handback Reserve Account, up to an amount equal to such portion;

(2) If the issuer of the Handback Letter of Credit ceases to be a Reserve Bank, in the full amount of the Handback Letter of Credit, and following such a draw, the MBTA shall deposit such amount into the Handback Reserve Account, to be applied in accordance with Section 8.5; or

(3) If the Termination Date occurs prior to the issuance of a Handback Certificate, up to the full amount of the Handback Letter of Credit, less any amount that would be payable to the Systems Integrator in respect of the Handback Reserve Account balance pursuant to Appendix 13 (Termination Compensation).

(C) Return of Handback Letter of Credit. The Handback Letter of Credit shall remain effective until 60 days following the Expiration Date or until returned to the Systems Integrator in accordance with this Section. The MBTA shall return the Handback Letter of Credit to the Systems Integrator if there is any remaining value in the Handback Letter of Credit following the Expiration Date and the exercise of all drawing rights by the MBTA pursuant to Section 8.6(B)(1), promptly following the exercise by the MBTA of such drawing rights.

ARTICLE 9

PERSONNEL, LABOR AND CONTRACTING PRACTICES

SECTION 9.1. PERSONNEL.

(A) Key Personnel. The Systems Integrator acknowledges that the identity and commitment of the Key Personnel identified in Appendix 10 (Key Personnel and Project Contractors) were material factors in the selection of the Systems Integrator to perform this Project Agreement. The Systems Integrator shall utilize such personnel to perform the roles and services identified in Appendix 10 (Key Personnel and Project Contractors) unless the Systems Integrator obtains the written consent of the MBTA to replace such Key Personnel, which consent shall be in the discretion of the MBTA, or unless such personnel are unavailable for good cause shown. "Good cause shown" shall not include performing services on other projects for any Systems Integrator Person or any Affiliate of a Systems Integrator Person, but shall include termination for cause, employee death, disability, retirement, resignation or any job protected leave available under Applicable Law. In the event of any such permissible unavailability, the Systems Integrator shall retain a replacement with equivalent expertise and experience to the unavailable Key Personnel, which replacement shall be satisfactory to the MBTA, acting reasonably. The Systems Integrator shall replace any Key Personnel at the request of the MBTA, after notice and a reasonable opportunity for corrective action, in the event the MBTA determines, acting reasonably, that an unworkable relationship has developed between such Key Personnel and the MBTA.

(B) Contact Information. The Systems Integrator shall ensure that the MBTA has appropriate contact information for each person designated as Key Personnel at all times.

(C) Staffing Generally. The Systems Integrator shall provide for staffing of the performance of the Contract Services in accordance with the Contract Standards with qualified personnel who meet all applicable licensing and certification requirements imposed by Applicable Law. All persons engaged by any Systems Integrator Person in the performance of the Contract Services shall have the requisite skills for the tasks assigned. The Systems Integrator shall notify the MBTA of any material change in staffing levels and positions from time to time, and shall not make any such material change if the new staffing level would adversely affect the ability of the Systems Integrator to perform the Contract Services in accordance with the Contract Standards.

(D) Disputes. The Systems Integrator shall furnish staffing and labor that can work in harmony with all other elements of staffing and labor employed for the performance of the Contract Services. The Systems Integrator shall have exclusive responsibility for disputes or jurisdictional issues among unions or trade organizations representing employees of any Systems Integrator Person. The MBTA shall have no responsibility whatsoever for any such disputes or issues, and the Systems Integrator shall indemnify, defend and hold harmless the MBTA and all other Indemnified Parties from any and all Loss-and Expense resulting from any such dispute. If the Systems Integrator has knowledge of an actual or potential labor dispute that may affect any of the Contract Services, the Systems Integrator shall promptly:

- (1) Provide notice thereof to the MBTA, including all relevant information related to the dispute of which the Systems Integrator has knowledge; and
- (2) Use all reasonable efforts to ensure that such labor dispute does not affect the performance of any of the Contract Services, including by applying for relief to appropriate Governmental Bodies.

(E) Fair Employment Practices. No Systems Integrator Person may harass, discriminate or retaliate against any employee or applicant for employment because of race, color, religion, creed, ancestry, gender, national origin, ethnicity, age, disability, sexual orientation, genetic status, gender identity or expression, veteran status (including Vietnam-era veterans) or background. The Systems Integrator shall:

(1) Develop and implement an equal employment opportunity and affirmative action program to ensure that all employees and applicants are treated without regard to their race, color, religion, creed, ancestry, gender, national origin, ethnicity, age, disability, sexual orientation, genetic status, gender identity or expression, veteran status (including Vietnam-era veterans) or background;

(2) In all solicitations or advertisements for employees placed by or on behalf of the Systems Integrator, state that the Systems Integrator is an equal opportunity employer;

(3) Include the provisions of this Section in every Project Contract, and ensure that every Subcontract in an amount of \$50,000 or more includes such provisions, so that the provisions of this Section will be binding upon every Project Contractor and applicable Subcontractor.

SECTION 9.2. PROJECT CONTRACTORS AND SUBCONTRACTORS.

(A) Generally. The MBTA acknowledges that the Systems Integrator may carry out the Contract Services by contracting certain obligations to Project Contractors, who in turn may contract all or part of their obligations under any Project Contract to one or more Subcontractors, subject to the limitations set forth herein.

(B) Required Use of Project Contractors. The Systems Integrator shall use the Project Contractors identified in Appendix 10 (Key Personnel and Project Contractors) for the performance of the Contract Services in the roles indicated in Appendix 10 (Key Personnel and Project Contractors), subject to the Systems Integrator's right to terminate a Project Contract for cause in accordance with Section 9.3.

(C) Restricted Persons. In providing the Contract Services, the Systems Integrator shall not contract with, or allow any Systems Integrator Person to contract with, any person that, in the reasonable opinion of the MBTA, is a Restricted Person.

(D) Diversity in Contracting. The MBTA promotes equity of opportunity in contracting; and to that end, encourages full participation of veteran-owned, disability-owned, minority-owned, woman-owned and LGBT-owned business enterprises, as those terms are defined by the Commonwealth's Supplier Diversity Office. The Systems Integrator shall not, and shall not permit any Project Contractor or Subcontractor to, discriminate against any such business enterprises in contracting for services in connection with the Project.

(E) Terms and Actions. The Systems Integrator shall retain full responsibility to the MBTA under this Project Agreement for all matters related to the Contract Services. No failure of any Project Contractor or Subcontractor used by the Systems Integrator in connection with the provision of the Contract Services shall relieve the Systems Integrator from its obligations hereunder to perform the Contract Services. The Systems Integrator shall be responsible for settling and resolving with all Project Contractors and Subcontractors all claims arising from the actions or inactions of the Systems Integrator or a Project Contractor or Subcontractor. Without limiting any requirement under Appendix 3.1, all

Project Contracts shall require the Project Contractor, to the extent of the Contract Services to be furnished or performed under the applicable Project Contract, to be bound by the applicable terms and conditions of this Project Agreement.

(F) Indemnity for Claims. The Systems Integrator shall pay or cause to be paid to the Project Contractors and all Subcontractors all amounts due in accordance with Applicable Law and their respective Project Contracts and Subcontracts. No Project Contractor or Subcontractor shall have any right against the MBTA for labor, services, materials or equipment furnished for the Contract Services. The Systems Integrator acknowledges that its indemnity obligations under Article 18 (Indemnification) shall include all claims for payment or damages by any Project Contractor or Subcontractor who furnishes or claims to have furnished any labor, services, materials or equipment in connection with the Contract Services.

(G) Reporting. Without limiting any other obligation hereunder, the Systems Integrator shall prepare and maintain a current record of all Subcontracts (including all Subcontracts in respect of Utilities and Retail Reload Locations), which record shall accurately identify the purpose of each Subcontract, the parties thereto and the services provided thereunder. The Systems Integrator shall provide the MBTA with such record upon the achievement of each Key Milestone, on each anniversary of the Full Service Commencement Date and as otherwise reasonably requested by the MBTA.

SECTION 9.3. MATERIAL CONTRACTS.

(A) MBTA Consents. Unless the Systems Integrator has, at its earliest practicable opportunity, submitted to the MBTA notice of the proposed course of action (and any relevant documentation) and the MBTA has consented to such course of action, acting reasonably, the Systems Integrator shall not:

- (1) Terminate, or agree to or permit the termination of, all or any material part of any Material Contract;
- (2) Make, or agree to or permit the making of:
 - (a) Any material amendment of any Material Contract; or
 - (b) Any waiver, or departure by, any party from any material provision of any Material Contract;
- (3) Permit any Material Contract Party to assign or transfer to any person any of such Material Contract Party's rights or obligations under a Material Contract other than by way of a Subcontract that is not a subcontract of all or substantially all of the obligations under the Material Contract; or
- (4) Enter into, or permit the entering into of, any Material Contract other than those entered into on or before the Effective Date; provided, that,

Without limiting the obligation of the Systems Integrator to provide notice of any of the foregoing, the MBTA's consent shall not be required for any course of action that could not reasonably be expected to have a material adverse effect on the ability of the Systems Integrator to perform its obligations under this Project Agreement.

(B) Timeframe for Consents. The MBTA shall give or deny its consent to the extent required under Section 9.3(A) within:

- (1) Five Business Days of receipt of such notice and all relevant documentation, if the Systems Integrator is seeking to terminate a Material Contract immediately; and
- (2) 10 Business Days of receipt of such notice and all relevant documentation in all other cases.

Subject to subsection (C) of this Section, if the MBTA fails to give or deny its consent within such time periods, it shall be deemed to have given its consent. The giving or denial of consent by the MBTA shall not create any liability of the MBTA to the Systems Integrator or to any third party.

(C) Contracts with Affiliates. Notwithstanding any of the foregoing, in no event shall the Systems Integrator provide for the performance of Contract Services through an Affiliate of the Systems Integrator unless:

- (1) The Affiliate is qualified, experienced and capable in the performance of the portion of the Contract Services to be performed by the Affiliate;
- (2) The Systems Integrator executes a written contract with the Affiliate, which contract shall:
 - (a) Be a Material Contract hereunder;
 - (b) Comply with all applicable provisions of this Project Agreement and be consistent with Good Industry Practice;
 - (c) Set forth the scope of the Contract Services to be performed by the Affiliate and all the pricing, terms and conditions respecting the performance of such scope of work;
- (3) The pricing, scheduling and other terms and conditions of the Material Contract are no less favorable to the Affiliate than those that the Systems Integrator could reasonably obtain in an arms' length, competitive transaction with an unaffiliated contractor, with the Systems Integrator bearing the burden of proving that the same are no less favorable to the Affiliate; and
- (4) Before entering into such Material Contract or any supplement or amendment thereto, the Systems Integrator shall have submitted a true and complete copy of the proposed Material Contract to the MBTA and shall have obtained the consent of the MBTA; provided that:
 - (a) The MBTA shall have a period of not less than 20 Business Days after receipt to give or deny its consent; and
 - (b) If the MBTA fails to give or deny its consent within such time period, it shall be deemed to have denied its consent

No Affiliate shall be engaged to perform any Contract Services which this Project Agreement indicates are to be performed by an independent or unaffiliated party. The Systems Integrator shall make no payments to Affiliates for work or services in advance of provision of such work or

services, except for reasonable mobilization payments or other payments consistent with arm's length, competitive transactions of similar scope.

SECTION 9.4. REPLACEMENT MATERIAL CONTRACTS.

If any Material Contract at any time lapses, terminates, or otherwise ceases to be in full force and effect (whether by reason of expiration or otherwise), unless the goods, services or rights which were the subject matter of such Material Contract are no longer reasonably required for the Project and without limiting anything under Section 9.3, the Systems Integrator shall promptly:

- (1) Enter into, or cause to be entered into, a replacement contract or contracts upon the same or substantially similar terms as the contract so replaced (to the extent reasonably practicable); and
- (2) If the MBTA and the relevant Material Contract Party had entered into a Material Contract Direct Agreement with respect to the replaced Material Contract, concurrently with the execution of such replacement contract or contracts, enter into, and cause the replacement Material Contract Party to enter into, a Material Contract Direct Agreement.

SECTION 9.5. DELIVERY OF AMENDED OR REPLACEMENT MATERIAL CONTRACTS.

If at any time any amendment is made to any Material Contract, or a replacement Material Contract (or any agreement which materially affects the interpretation or application of any Material Contract) is entered into, the Systems Integrator shall deliver to the MBTA a copy of each such amendment or agreement within 10 Business Days of the date of its execution or creation, certified as a true copy by the Systems Integrator Representative.

ARTICLE 10

PAYMENTS

SECTION 10.1. PAYMENTS GENERALLY.

(A) Obligation to Make Monthly Payments. During the Operating Period, the MBTA shall pay Monthly Payments to the Systems Integrator as compensation for the Systems Integrator's performance of the Contract Services in accordance with the terms and conditions set forth in this Article 10 (Payments) and Appendix 8 (Payment Mechanism).

(B) Calculation of Monthly Payments. The amount of each Monthly Payment shall be calculated in accordance with Appendix 8 (Payment Mechanism). The Systems Integrator acknowledges that Monthly Payments are subject to certain Deductions for failures of performance under this Project Agreement, as set forth in Appendix 8 (Payment Mechanism), and to the MBTA's rights of set-off in accordance with Section 10.4.

(C) Limitation on Payments. Other than the payments expressly provided for herein, the Systems Integrator shall have no right to any further payment from the MBTA in connection with the Contract Services or otherwise in connection with the Project.

(D) No Waiver or Acceptance. No payment by the MBTA shall:

(1) Be construed as an acceptance or approval by the MBTA of any Contract Services that have not been performed or completed in accordance with the requirements of this Project Agreement; or

(2) Operate to relieve the Systems Integrator from any of its obligations under this Project Agreement.

SECTION 10.2. INVOICING AND PAYMENT.

(A) Monthly Invoice. No later than the twentieth day of each Month following the Month in which the first day of Pilot Phase 1 occurs, the Systems Integrator shall submit invoices for the prior Month (together and as specified in Appendix 8 (Payment Mechanism), the "**Monthly Invoice**") in a form acceptable to the MBTA, acting reasonably, which shall include, at a minimum:

(1) The amount and calculation of the Monthly Payment in accordance with Appendix 8 (Payment Mechanism), including such supporting documentation as is reasonably required to substantiate and confirm the invoiced amount;

(2) Evidence that all Project Contractors and Subcontractors have waived any rights to Liens;

(3) As an attachment, the Monthly Performance Report prepared in accordance with Appendix 8 (Payment Mechanism); and

(4) A certificate of the Systems Integrator Representative certifying compliance with Section 16.4 and that all Submittals that have been submitted for the prior Month, including the Monthly Performance Report and all Submittals required under Appendix 4.2, 4.5 and the Monitoring Plan most recently accepted by the MBTA, are accurate and complete.

(B) MBTA Review and Payment. The MBTA shall review each Monthly Invoice and Monthly Performance Report and shall use all reasonable efforts to notify the Systems Integrator within 15 days following receipt if the MBTA disputes any part of the Monthly Invoice or Monthly Performance Report; provided that, the failure of the MBTA to provide such notification shall not serve to waive any right of the MBTA hereunder. If the MBTA disputes any part of a Monthly Invoice, the Systems Integrator shall, without limiting any right to payment that may be required under Section 10.5(3), promptly submit a revised Monthly Invoice reflecting only the undisputed amount. If any Monthly Invoice or Monthly Performance Report is inaccurate or incomplete in any material respect, the Systems Integrator shall promptly submit a corrected, accurate and complete Monthly Invoice and Monthly Performance Report. Within 30 days following receipt of an accurate and complete Monthly Invoice and Monthly Performance Report, the MBTA shall pay the Systems Integrator the amount due in respect of such Monthly Invoice.

SECTION 10.3. TAXES.

Except as otherwise expressly provided in this Project Agreement, the Systems Integrator shall be responsible for all federal, Commonwealth and municipal Taxes and any other Tax imposed in connection with its performance of the Contract Services. The Parties acknowledge and agree that:

- (1) The Monthly Payments are inclusive of all Taxes payable by the Systems Integrator in connection with the performance of the Contract Services; and
- (2) The Systems Integrator shall be entitled to the MBTA's exemption under M.G.L. c. 64H in respect of materials and equipment that become part of the System.

SECTION 10.4. MBTA'S RIGHT OF SET OFF.

Once the MBTA determines that any credits, payments, reimbursements or Deductions are owed to the MBTA in accordance with the terms and conditions of this Project Agreement and have not been reflected in any previously submitted Monthly Invoice, the MBTA shall notify the Systems Integrator and the Systems Integrator shall reflect such amounts in the next Monthly Invoice provided to the MBTA under this Article. In the event the Systems Integrator does not include such amounts in the next Monthly Invoice provided to the MBTA in accordance with this Section, the MBTA shall have the right to offset the Monthly Payment otherwise payable for such Monthly Invoice by the amount of such credits, payments, reimbursements or Deductions; provided that:

- (1) Nothing in this Section shall limit the MBTA's right to dispute any Monthly Invoice and withhold payment of the disputed amount in accordance with Section 10.5;
- (2) Nothing in this Section shall limit the MBTA's right to interest on overdue amounts in accordance with Section 10.6; and
- (3) The MBTA shall have the right to offset the final Monthly Payment of the Term by the amount of any credits, payments, reimbursements or Deductions due to the MBTA under this Project Agreement, subject only to Section 10.5.

SECTION 10.5. BILLING STATEMENT DISPUTES.

If the MBTA disputes in good faith any amount billed by the Systems Integrator, the MBTA shall pay all undisputed amounts when due but may either:

- (1) Pay the disputed amount when otherwise due, and provide the Systems Integrator with a written objection indicating the amount that is being disputed and the reasons then known to the MBTA for its objection to or disagreement with such disputed amount; or
- (2) Withhold payment of the disputed amount, and provide the Systems Integrator with a written objection indicating the amount being disputed and the reasons then known to the MBTA for the dispute.

When any billing dispute is finally resolved:

- (3) If payment by the MBTA to the Systems Integrator of amounts withheld is required, such payment shall be made by the MBTA within 30 days of the date of resolution of the dispute, with interest in accordance with Section 10.6; and
- (4) If reimbursement by the Systems Integrator to the MBTA is required, such reimbursement payment shall be made by the Systems Integrator within 30 days of the date of resolution of the dispute, with interest in accordance with Section 10.6.

SECTION 10.6. INTEREST ON OVERDUE AMOUNTS. If payment of any amount payable under this Project Agreement by either Party is not made when due (including Termination Amounts), simple interest will be payable on such amount at the Overdue Rate and shall be calculated on the basis of a 365-day year from the date such payment is due under this Project Agreement until paid. The Party to whom payment is owed and overdue shall notify the other Party at least quarterly of the overdue amount.

ARTICLE 11

CHANGES

SECTION 11.1. MBTA CHANGES.

(A) MBTA Right to Require Changes. The MBTA may at any time during the Term, without invalidating this Project Agreement, require Changes in accordance with this Article 11 (Changes). Except to the extent that a Change Order or Change Directive expressly requires otherwise, the Systems Integrator shall implement each Change in accordance with all terms of this Project Agreement.

(B) Corrections of Defects or Deficiencies Not a Change. No requirement of the Systems Integrator to correct any defect or deficiency in the Contract Services or the System, including any MBTA direction to the Systems Integrator to provide for such correction in accordance with this Project Agreement, shall constitute an MBTA Change. Without limiting the foregoing, no Change authorized pursuant to an SI Change Request shall constitute and MBTA Change.

(C) Configuration Excluded. Except as expressly provided in Appendix 4.3 in respect of special exceptions, no Configuration required by the MBTA in accordance with this Project Agreement shall constitute an MBTA Change.

(D) Planned Expansions. The Planned Expansions identified in Appendix 2.8 are included within the scope of the Implementation Work and shall not constitute an MBTA Change; provided that:

(1) If any Location or Vehicle in respect of a Planned Expansion has not achieved a state of completion reasonably sufficient to enable the performance of Implementation Work in respect of such Location or Vehicle within 180 days prior to the Scheduled Transition Period Completion Date:

(a) The Implementation Work in respect of such Location or Vehicle shall be excluded from the Criteria for Transition Period Completion; and

(b) Upon such Location or Vehicle achieving such state of completion, the Systems Integrator shall perform and complete the Implementation Work in respect of such Location or Vehicle in accordance with Appendix 2.8;

(2) If any Location or Vehicle in respect of a Planned Expansion has not achieved a state of completion reasonably sufficient to enable the performance of Implementation Work in respect of such Location or Vehicle within 180 days prior to the Scheduled Full Service Commencement Date:

(a) The Implementation Work in respect of such Location or Vehicle shall be excluded from the Criteria for Full Service Commencement; and

(b) Upon such Location or Vehicle achieving such state of completion, the Systems Integrator shall perform and complete the Implementation Work in respect of such Location or Vehicle in accordance with Appendix 2.8; and

(3) It shall be an MBTA Change if any Planned Expansion has not achieved such state of completion by the first anniversary of the Full Service Commencement Date.

(E) No Entitlement to Perform a Change. Without prejudice to the Systems Integrator's rights under this Project Agreement, including its rights under Article 13 (Supervening Events), the MBTA may, at any time, perform, or engage any MBTA Person to perform, any work on the Locations that is not included in the Systems Integrator's obligations under this Project Agreement, and no Systems Integrator Person shall have any right or entitlement to perform any such work. The Systems Integrator may submit a proposal to the MBTA for the performance of such work, but nothing in this Project Agreement will obligate the MBTA to accept such proposal. The MBTA shall provide reasonable notice to the Systems Integrator prior to the performance of such work if such work could reasonably be expected to have a material effect on the performance of the Contract Services.

(F) Restrictions on MBTA Changes. The MBTA shall not at any time during the Term require, and the Systems Integrator may refuse to implement, an MBTA Change, which:

- (1) Would be contrary to Applicable Law;
- (2) Would render any policy of Required Insurance void or voidable, unless the MBTA agrees to provide replacement security satisfactory to the Systems Integrator acting reasonably;
- (3) Would cause the revocation of any Governmental Approval required by the Systems Integrator to perform its obligations under this Project Agreement, where such Governmental Approval would not, using all reasonable efforts, be capable of amendment or renewal;
- (4) Would require a new Governmental Approval, or an amendment to an existing Governmental Approval, for the Systems Integrator to perform its obligations under this Project Agreement, which Governmental Approval or amendment would not, using all reasonable efforts by the Systems Integrator or the MBTA, as applicable, be obtainable;
- (5) Would adversely affect the health and safety of any person;
- (6) Would, if implemented, materially and adversely change the nature of the totality of the Project; or
- (7) Would be unrelated to the kind of work and services initially procured by the RFP and to the type of work and services that Systems Integrator Persons provide in the marketplace.

If the Systems Integrator, acting reasonably, determines that a proposed MBTA Change is unacceptable because it contravenes one or more of the above, then the Systems Integrator shall promptly (in any event within 10 Business Days following receipt of any MBTA Change Notice or Change Directive) give written notice to the MBTA of its objection, explaining its reasons with supporting analysis. If the MBTA disagrees then it may deliver a dispute notice to the Systems Integrator, and the Parties shall cooperate to resolve the issue in a timely manner pursuant to the Dispute Resolution Procedures.

(G) Emergencies. In the event of a serious emergency, pandemic or disaster outside the control of the MBTA, the MBTA may through an MBTA Change, negotiate emergency performance from the Systems Integrator to address the immediate needs of the MBTA even if not contemplated under

the original Project Agreement or procurement, subject to the terms and conditions of this Article 11 (Changes).

SECTION 11.2. CHANGE NOTICE AND RESPONSE.

(A) **MBTA Change Notice.** The MBTA may at any time during the Term issue to the Systems Integrator a notice describing a potential MBTA Change that the MBTA is considering (an “**MBTA Change Notice**”). An MBTA Change Notice shall provide a reasonably sufficient description of the contemplated MBTA Change to permit the Systems Integrator to prepare a response in accordance with this Section, including any specific directions or requirements as to the contents of such response that are not otherwise required under Section 11.2(B). An MBTA Change Notice may, as reasonably determined by the MBTA, require the Systems Integrator to:

(1) Participate in a preliminary meeting regarding the contemplated MBTA Change at such time and location as the MBTA may reasonably determine; and

(2) At or before such preliminary meeting, deliver to the MBTA a written, preliminary response, including (as applicable):

(a) A preliminary scope of work associated with the contemplated MBTA Change;

(b) A preliminary schedule for implementation and any adjustment to the Project Schedule anticipated to be required as a result of the contemplated MBTA Change;

(c) A preliminary analysis of any performance relief to which the Systems Integrator may be entitled under Article 13 (Supervening Events) as a result of such contemplated MBTA Change, including a preliminary identification and assessment of any reasonably anticipated material impact of such contemplated MBTA Change on the performance of the Contract Services; and

(d) A preliminary estimate of any Change in Costs and, if applicable prior to the Full Service Commencement Date, any Financing Costs.

The Systems Integrator shall use all reasonable efforts to provide any such preliminary response to the MBTA in accordance with this Section 11.2(A).

(B) **Implementation Proposal.** Within 30 Business Days following the later of the Systems Integrator’s receipt of an MBTA Change Notice and any preliminary meeting held pursuant to Section 11.2(A), the Systems Integrator shall, subject to Section 11.1(F), submit to the MBTA its proposal to implement the contemplated MBTA Change (an “**Implementation Proposal**”), which shall include the following:

(1) A detailed scope of work for such MBTA Change, together with:

(a) A schedule for implementation of such scope of work; and

(b) If prior to the Full Service Commencement Date:

- (i) A revised Project Schedule reflecting adjustments required to implement such MBTA Change; and
 - (ii) A time impact analysis of the effect (if any) of such contemplated MBTA Change on the achievement of any Key Milestone;
- (2) The proposed method(s) for certification of completion of any aspects of the work required by such MBTA Change, which methods shall, to the extent possible, follow procedures already set out in this Project Agreement;
- (3) Any new Governmental Approvals, third-party consents, and any amendments to existing Governmental Approvals and third-party consents, required to implement such MBTA Change;
- (4) Any Amendment that may be required in order to implement the MBTA Change;
- (5) Identification and analysis of any impact on the performance of the Contract Services expected to result from implementation of the MBTA Change, including the extent to which relief from compliance with its obligations under this Project Agreement is required during the implementation of the MBTA Change pursuant to Article 13 (Supervening Events);
- (6) The proposed cost of implementing the MBTA Change, including all Change in Costs and, if applicable prior to the Full Service Commencement Date, any Financing Costs associated with delay, which cost proposal shall:
 - (a) Be in compliance with all requirements of this Project Agreement, including Appendix 11 (Unit Rates and Change in Cost Methodology);
 - (b) Include a detailed breakdown of each element of the proposed cost sufficient to enable the MBTA to review and evaluate the reasonableness of the same;
 - (c) Identify a “base amount” for the implementation of the MBTA Change presented according to line or pay items typically included on bid sheets of the MBTA and separated by labor, materials and equipment; and
 - (d) Without limiting any requirement under Appendix 11 (Unit Rates and Change in Cost Methodology), if any items in the base amount have been priced based on other than unit rates, identification of such items and the basis of pricing, with supporting reasons for the same;
- (7) Such supporting information and documentation as the MBTA may reasonably require in such MBTA Change Notice; and
- (8) A certification by the Systems Integrator Representative that:
 - (a) To the best of the knowledge of the Systems Integrator (after due inquiry), any performance relief, including schedule relief, and compensation requested is justified hereunder as to entitlement, extent and amount;

(b) The extent of any performance relief, the amount of time and the amount of compensation requested includes all known and anticipated impacts or amounts, which may be incurred as a result of the MBTA Change; and

(c) All cost and pricing data is complete, accurate and current.

(C) Review and Evaluation of Implementation Proposal. As soon as practicable after the MBTA receives the Implementation Proposal, the Systems Integrator shall meet with the MBTA, at such time and location as the MBTA may reasonably request, to review and discuss the Implementation Proposal. During such discussions, or otherwise by written notice, the MBTA may in its discretion, subject to Section 11.1(F), request or require modifications to the Implementation Proposal, including to require the Systems Integrator to solicit competitive bids or proposals for all or any part of the work that would result from the MBTA Change. The Systems Integrator shall promptly (in any event within 15 Business Days) after receipt of any such notice from the MBTA, provide the MBTA with an update to its Implementation Proposal to account for any consequential changes.

(D) MBTA Response. Within 15 Business Days following the later of the meeting or the receipt of an updated Implementation Proposal, in each case pursuant to Section 11.2(C), the MBTA shall:

(1) Notify the Systems Integrator in writing of its acceptance of the Implementation Proposal, subject to Section 11.2(E);

(2) Request or require further modifications to the Implementation Proposal from the Systems Integrator, in which case the procedures set forth in this Section shall be repeated; or

(3) Withdraw the MBTA Change Notice, subject to Section 11.2(F).

(E) Change Order. If the MBTA accepts an Implementation Proposal pursuant to Section 11.2(D)(1), the Parties shall promptly execute an appropriate Change Order in a form prepared by the MBTA to give effect to the relevant MBTA Change in accordance with the terms of the accepted Implementation Proposal. The execution of any such Change Order by the Systems Integrator Representative shall constitute an acknowledgement and agreement by the Systems Integrator that, except as may be expressly set forth in the Change Order pursuant to the accepted Implementation Proposal:

(1) The Change Order constitutes full accord and satisfaction in respect of the relevant MBTA Change;

(2) The Systems Integrator reserves no right to pursue any subsequent claim concerning the relevant MBTA Change; and

(3) All necessary amendments to this Project Agreement in respect of the relevant MBTA Change are reflected in the Change Order.

The Systems Integrator shall comply with each such Change Order and commence implementation of the relevant MBTA Change on the date set forth therein.

(F) Withdrawal of MBTA Change Notice. If the MBTA withdraws an MBTA Change Notice pursuant to Section 11.2(D)(3), the MBTA shall, subject to Appendix 11 (Unit Rates and Change in Cost Methodology) reimburse the Systems Integrator for the reasonable and documented costs incurred by the Systems Integrator in preparing a written preliminary response (if required by the MBTA)

pursuant to Section 11.2(A)(2) and the Implementation Proposal, including any required update thereto, within 30 days following receipt of an invoice for the same in form and content reasonably acceptable to the MBTA.

SECTION 11.3. CHANGE DIRECTIVES.

Subject to Section 11.1(F), but notwithstanding any other provision of this Article (Changes), the MBTA may in its discretion issue to the Systems Integrator a written notice directing the Systems Integrator to proceed with an MBTA Change (a “**Change Directive**”). Any Change Directive shall:

- (1) State that it is issued pursuant to this Section 11.3;
- (2) Describe the subject MBTA Change in a manner sufficient to enable the Systems Integrator to proceed with the MBTA Change; and
- (3) Specify the effective date of the subject MBTA Change.

Promptly upon receipt of a Change Directive, the Systems Integrator shall implement the MBTA Change in accordance with the terms set forth in the Change Directive, subject to Section 11.1(F). The issuance of a Change Directive in accordance with this Section shall constitute a Compensation Event. Without limiting the MBTA’s rights under this Section, the Parties intend that MBTA Changes will be negotiated between the Parties in accordance with Section 11.2 and that Change Directives will be issued only under urgent, exigent or emergency circumstances.

SECTION 11.4. MBTA CHANGE RESERVES.

(A) Establishment of Accounts. On the Financial Close Date, the Systems Integrator shall establish and fund separate accounts for the External Interfaces Reserve and the Unplanned Expansions Reserve in the amounts specified in this Section to be held and controlled by a Reserve Bank to be agreed between the Parties, acting reasonably, and shall provide to the MBTA the details regarding each specified account, including the name, address and contact information for the Reserve Bank and the account number. The Parties agree that:

- (1) Withdrawals from the External Interfaces Reserve account and the Unplanned Expansions Reserve account will be controlled by the operation of an account control agreement to be agreed between the Parties, acting reasonably, and entered into by the Parties on the Financial Close Date;
- (2) Withdrawals from the External Interfaces Reserve account and the Unplanned Expansions Reserve account shall be made only in accordance with and for the purposes specified in this Section;
- (3) Any withdrawal from the External Interfaces Reserve account or the Unplanned Expansions Reserve account by the Systems Integrator will require the prior written approval of the MBTA, subject to Section 11.4(E);
- (4) The Systems Integrator shall not be permitted to grant any security interest to any third party in relation to the External Interfaces Reserve account or the Unplanned Expansions Reserve account;

(5) Without limiting anything under Section 11.4(H), the MBTA may not make any withdrawals from the External Interfaces Reserve account or the Unplanned Expansions Reserve account.

(B) External Interfaces Reserve. The reserve established for the Implementation Work required pursuant to Section 2.3 of Appendix 3.10 (the “**External Interfaces Reserve**”) shall be in the amount of \$1,600,000. The Parties intend to further define the scope of the Implementation Work described in Section 2.3 of Appendix 3.10 pursuant to the procedures set forth in this Article 11 (Changes) and shall use all reasonable efforts to agree on the final amount for each item of relevant Implementation Work prior to the commencement of such Implementation Work. Payment for such Implementation Work shall be based on the Unit Rates for work classifications in accordance with Appendix 11 (Unit Rates and Change in Cost Methodology). Without limiting anything under Section 11.4(E), the Systems Integrator shall not be entitled to withdraw any amount from the External Interfaces Reserve account prior to the execution of a Change Order by the Parties, or the issuance of a Change Directive by the MBTA, specifying the scope of the relevant Implementation Work and the payments to be made therefor.

(C) Unplanned Expansions Reserve. The reserve established for Unplanned Expansions (the “**Unplanned Expansions Reserve**”) shall be in the amount of \$8,400,000. Without limiting anything under Section 11.4(E), the Systems Integrator shall not be entitled to withdraw any amount from the Unplanned Expansions Reserve account prior to the execution of a Change Order by the Parties, or the issuance of a Change Directive by the MBTA, authorizing work in respect of an Unplanned Expansion and specifying the scope of such work and the payments to be made therefor, as determined in accordance with Appendix 11 (Unit Rates and Change in Cost Methodology).

(D) Withdrawals from Accounts. Subject to the foregoing and the approval of the MBTA in accordance with Section 11.4(E), the Systems Integrator may withdraw funds from the External Interfaces Reserve account and the Unplanned Expansions Reserve account in such amounts and at such times as needed to pay amounts attributable to Change in Cost that have become due and payable by the Systems Integrator in respect of:

(1) In the case of a withdrawal from the External Interfaces Reserve account, the performance of Implementation Work described in Section 2.3 of Appendix 3.10, the scope of which has been established by Change Order or Change Directive in accordance with Section 11.4(B); and

(2) In the case of a withdrawal from the Unplanned Expansions Reserve account, the performance of work in respect of an Unplanned Expansion that has been authorized by Change Order or Change Directive in accordance with Section 11.4(C).

(E) MBTA Approval. Prior to drawing funds from the External Interfaces Reserve account or the Unplanned Expansions Reserve account, as applicable, the Systems Integrator shall provide the MBTA with written notice indicating the amount to be drawn, together with evidence of the costs that are the subject of such drawing; the purpose for which funds have been used; evidence that all Project Contractors and Subcontractors have waived any rights to Liens; and such other supporting information as the MBTA may reasonably require. Within 15 Business Days from the date of the receipt of such notice, the MBTA shall either approve or withhold its approval of the proposed withdrawal; provided that, the MBTA may only withhold its approval to a proposed withdrawal under this Section 11.4(E) if:

(1) In the case of a withdrawal from the External Interfaces Reserve account, the requirements specified in Section 11.4(B) in respect of a Change Order or Change Directive have not been met;

(2) In the case of a withdrawal from the Unplanned Expansions Reserve account, the requirements specified in Section 11.4(C) in respect of a Change Order or Change Directive have not been met;

(3) The Systems Integrator fails to provide the information required under this Section 11.4(E); or

(4) The Systems Integrator is unable to demonstrate to the reasonable satisfaction of the MBTA that the proposed withdrawal amount:

(a) Will be used to meet Change in Costs incurred by the Systems Integrator in undertaking (i) in the case of a withdrawal from the External Interfaces Reserve account, Implementation Work in accordance with Section 2.3 of Appendix 3.10 and the applicable Change Order or Change Directive, and (ii) in the case of a withdrawal from the Unplanned Expansions Reserve account, work in respect of an Unplanned Expansion in accordance with the applicable Change Order or Change Directive authorizing such Unplanned Expansion; and

(b) Is consistent with all terms and conditions specified in the applicable Change Order or, in the case of a Change Directive, Appendix 11 (Unit Rates and Change in Cost Methodology).

(F) Amounts in Excess of External Interfaces Reserve Account. Subject to the terms of any Change Order executed by the Parties in respect of the External Interfaces Reserve, the MBTA shall be responsible for Change in Cost incurred by the Systems Integrator in performing the Implementation Work required pursuant to Section 2.3 of Appendix 3.10 to the extent such Change in Cost exceeds the amount available in the External Interfaces Reserve account; provided that, the Systems Integrator shall provide written notice to the MBTA not later than 30 days prior to the date the Systems Integrator reasonably expects that its Change in Cost will exceed the amount available in the External Interfaces Reserve account, which written notice shall specify the expected amount of such excess Change in Cost and, without limiting any obligation under Section 25.2(A), any opportunities to reduce such Change in Cost. Unless otherwise directed in writing by the MBTA in its discretion, the Systems Integrator shall not suspend the performance of the Implementation Work under such circumstances. The amount of any MBTA payment obligation under this Section 11.4(F) shall be determined in accordance with Appendix 11 (Unit Rates and Change in Cost Methodology) based solely on Unit Rates in respect of work classifications.

(G) Amounts in Excess Unplanned Expansions Reserve. Subject to the terms of any Change Order executed by the Parties in respect of any Planned Expansion, the MBTA shall be responsible for Change in Cost associated any Unplanned Expansion authorized by a Change Order or Change Directive to the extent such Change in Cost exceeds the amount available in the Unplanned Expansions Reserve account.

(H) Disposition of Amounts in Reserve Accounts. Any amount remaining in the External Interfaces Reserve account as of the Full Service Commencement Date shall be withdrawn and paid to the MBTA; provided that, if the Termination Date occurs prior to the Full Service Commencement Date, any amount remaining in the External Interfaces Reserve account as of the

Termination Date shall be withdrawn and paid to the MBTA. Any amount remaining in the Unplanned Expansions Reserve as of the Termination Date shall be withdrawn and paid to the MBTA.

(I) Accrued Interest. Any interest that accrues on amounts standing to the credit of the External Interfaces Reserve account and the Unplanned Expansions Reserve account shall only be withdrawn at the time other amounts are being withdrawn therefrom and subject to the terms and conditions of this Section.

SECTION 11.5. SI CHANGES.

(A) Restrictions. The Systems Integrator shall not implement any Change absent the approval of the MBTA through a Change Order or Change Directive.

(B) SI Change Request. The Systems Integrator may at any time during the Term submit a written request for the MBTA to approve a Change proposed by the Systems Integrator (an “**SI Change Request**”), which shall include:

(1) A statement as to the Systems Integrator’s reasons for proposing the Change, including as to whether such Change is being proposed by the Systems Integrator:

(a) To remedy any defect or deficiency in the Implementation Work or the System (a “**Remedial Change**”);

(b) To mitigate the impact of a Compensation Event; or

(c) For the overall benefit of the Project;

(2) Reasonably sufficient detail concerning the proposed Change to enable the MBTA to evaluate the proposed Change in full, including, as applicable, all relevant information required to be included in an Implementation Proposal;

(3) An indication of the implications of the proposed Change, including the comparative advantages of the proposed Change to the Systems Integrator and the MBTA;

(4) Any dates by which a response by the MBTA to the request is critical; and

(5) Such other information and documentation as may be reasonably requested by the MBTA to fully evaluate and consider the proposed Change.

(C) MBTA Evaluation. Any SI Change Request shall be subject to the approval of the MBTA in its discretion; provided, that the MBTA:

(1) Shall not unreasonably withhold its approval of an SI Change Request reasonably intended to mitigate the impact of a Compensation Event; and

(2) Agrees to evaluate any SI Change Request in good faith, taking into account all issues that are relevant to the MBTA, including whether:

(a) The SI Change Request proposes any change in the Availability Payments or any other compensation or payment to the Systems Integrator or to the MBTA;

(b) The proposed Change would affect the quality of any aspect of the Contract Services or the likelihood of successful and timely performance of the Contract Services;

(c) The proposed Change would or may interfere with the relationship between the MBTA and any third party, including any Governmental Body or Regional Transit Provider;

(d) The financial strength of the Systems Integrator is sufficient to implement the proposed Change; and

(e) The proposed Change would or may materially affect the risk, cost or liabilities to which the MBTA will or may be exposed.

As part of the evaluation of an SI Change Request, if determined to be appropriate in the MBTA's discretion, the Parties shall meet at such time and location as the MBTA may reasonably request to review and discuss the SI Change Request.

(D) MBTA Approval. If the MBTA approves an SI Change Request (with or without modification), the Parties shall promptly execute an appropriate Change Order in a form prepared by the MBTA to give effect to the relevant Change and definitively stating (or, in the MBTA's discretion, confirming by way of incorporation of the relevant SI Change Request) all details concerning the relevant Change, including (as applicable):

(1) Any extension of time, relief or compensation, including the payment terms of, and supporting documentation required for, any such compensation;

(2) In the case of any Remedial Change, compensation to the MBTA and the associated payment terms in respect of any reduction in value in accordance with Section 11.6(A);

(3) Any sharing of savings with the MBTA pursuant to Section 11.6(B); and

(4) The commencement date for the implementation of the approved Change.

Except as may be required in respect of a Change reasonably intended to mitigate the impact of a Compensation Event (in which case all terms and conditions of Article 13 (Supervening Events) shall apply) or as otherwise agreed to by the MBTA in its discretion, there shall be no increase in Availability Payments or other additional compensation payable to the Systems Integrator as a result of any Change proposed by the Systems Integrator pursuant to this Section 11.5.

(E) Implementation of Approved Change. The Systems Integrator shall implement any Change approved by the MBTA pursuant to this Section 11.5 in accordance with the terms and conditions set forth in the relevant Change Order. No Change approved by the MBTA pursuant to this Section 11.5 shall constitute an MBTA Change or, in and of itself, a Compensation Event.

SECTION 11.6. COST SAVINGS.

(A) MBTA Change or Remedial Change. If in connection with any MBTA Change or Remedial Change documented in a Change Order or Change Directive:

- (1) The Systems Integrator's Change in Costs reflects a net savings to the Systems Integrator; or
- (2) With respect to any Remedial Change, the value of the Contract Services or the System has been reduced (as reasonably determined by the Parties, subject to the Dispute Resolution Procedures); then:

In the case of an MBTA Change, the MBTA shall be entitled to 100% of such net savings and, in the case of a Remedial Change, compensation in the amount of 100% of such reduction in value. Any net savings calculation under this Section shall factor in any increased cost incurred by the Systems Integrator to produce the relevant savings.

(B) SI Change Request and Shared Savings. If any SI Change Request proposes or is reasonably expected to result in a net savings to the Systems Integrator, the MBTA shall be entitled to share in such net savings. If the MBTA approves any such SI Change Request, the extent of any such sharing in savings shall be set forth in the relevant Change Order.

(C) Method of Payment. The MBTA shall be entitled, in its discretion, to elect to receive its share of any savings or reduction in value pursuant to this Section:

- (1) As a lump sum payment (or series of payments) from the Systems Integrator within 30 days after:
 - (a) In the case of a net savings, such net savings (or portion thereof) is realized by the Systems Integrator; or
 - (b) With respect to any reduction in value resulting from a Remedial Change, the date of the relevant Change Order;
- (2) Through an adjustment to the Availability Payments; or
- (3) By way of set-off in accordance with Article 10 (Payments).

SECTION 11.7. NO SUSPENSION OF PERFORMANCE.

Without limiting any right of the Systems Integrator to Supervening Event relief pursuant to Article 13 (Supervening Events) and subject to Section 11.1(F), the Systems Integrator shall not suspend the performance of the Contract Services during the negotiation of any MBTA Change Notice or SI Change Request, except as may be otherwise directed by the MBTA in writing.

ARTICLE 12

EXPANSION TO REGIONAL TRANSIT PROVIDERS

SECTION 12.1. APPLICABILITY.

The System shall be capable of expansion to serve Regional Transit Providers in accordance with the Technical Requirements. Except as otherwise provided in this Article or agreed or determined by the MBTA in its discretion, as between the MBTA and the Systems Integrator, any expansion of the System to serve a Regional Transit Provider shall be governed by the terms and conditions of this Article and shall not constitute an MBTA Change or a Supervening Event.

SECTION 12.2. SI RESPONSIBILITIES.

The Systems Integrator acknowledges and agrees that:

(1) The MBTA has a material interest in the capability of the System to expand and serve Regional Transit Providers in order to make public transportation services a seamless network as viewed by travelers in the region;

(2) Subject to the terms and conditions of this Article, Regional Transit Providers will be entitled to obtain pricing for Devices, Readers, configuration and other scheduled services as expressly set forth in Appendix 11 (Unit Rates and Change In Cost Requirements); and

(3) The Systems Integrator's obligation to perform the Contract Services includes the obligation to:

(a) Maintain the capability throughout the Term to expand the System to serve Regional Transit Providers in accordance with this Article, including the capability to provide Regional Transit Providers with all Devices, Readers and APIs necessary for any such expansion;

(b) Cooperate with the MBTA in connection with any opportunity to expand the System to serve a Regional Transit Provider; and

(c) Ensure that no System expansion to serve Regional Transit Providers results in any diminished performance by the Systems Integrator of its obligations to the MBTA under this Project Agreement.

SECTION 12.3. CONTRACTING WITH REGIONAL TRANSIT PROVIDERS.

(A) RTP Contract. At the election of a Regional Transit Provider and with the approval of the MBTA, the Systems Integrator shall use all reasonable efforts to cause the Project Contractor to enter into a separate contract with such Regional Transit Provider (an "**RTP Contract**"), which shall provide for:

(1) Expansion of the System to serve such Regional Transit Provider in accordance with this Article;

(2) All supporting services reasonably required by such Regional Transit Provider, at no higher a service level than provided to the MBTA pursuant to the Technical Requirements;

(3) Subject to Section 12.3(B), compliance with all applicable Technical Requirements; and

(4) Terms and conditions, including pricing terms in accordance with Section 12.2(2), not less favorable than the terms and conditions provided to the MBTA pursuant hereto, as reasonably modified to reflect changes to accommodate material differences in the operations of such Regional Transit Provider from those of the MBTA.

The Systems Integrator shall have no obligation hereunder to enter into any RTP Contract or to provide for the financing of any RTP Contract.

(B) Applicability of the Technical Requirements. Any RTP Contract shall require the Project Contractor to comply with:

(1) All Technical Requirements in respect of User privacy and the integrity and security of the System, including all requirements in respect of information security; and

(2) Except as otherwise agreed to by the applicable Regional Transit Provider, all Technical Requirements in respect of the functionality of any Devices and Readers provided to the Regional Transit Provider under the RTP Contract.

Any other Technical Requirement will be subject to negotiation between the Project Contractor and the applicable Regional Transit Provider; provided that, the Parties acknowledge and agree that Technical Requirements in respect of the physical installation of Devices and Readers, including requirements in respect of Key Milestones, will not be applicable under any RTP Contract.

(C) Implementation Through MBTA Change. Nothing in this Article shall be construed to limit the right of the MBTA to provide for expansion of the System to a Regional Transit Provider under this Project Agreement as an MBTA Change, subject to the terms and conditions of Article 11 (Changes).

ARTICLE 13

SUPERVENING EVENTS

SECTION 13.1. SUPERVENING EVENTS GENERALLY.

(A) Extent of Relief Available to the Systems Integrator. If a Relief Event or Compensation Event occurs, the Systems Integrator may seek relief from its obligations, extensions of time, and may claim compensation, as and to the extent provided in this Article; provided that the Systems Integrator may claim compensation relief hereunder solely in the event of the occurrence of a Compensation Event and to the extent provided in Section 17.3(D)(3).

(B) General Limitations. The Systems Integrator shall not be entitled to Supervening Event relief hereunder to the extent the occurrence or effect of any Supervening Event results from the willful or negligent act, error or omission, failure to exercise reasonable diligence, or breach of this Project Agreement on the part of any Systems Integrator Person, including any Systems Integrator Fault. Supervening Event relief hereunder shall be limited to that relief which properly reflects the interference with performance, the time lost or the amount of the increased cost (as applicable), in each case as a direct result of the occurrence of the Supervening Event and only to the minimum extent reasonably forced on the Systems Integrator by the Supervening Event.

(C) No Relief from Payment Obligations. No Supervening Event shall serve to excuse the Systems Integrator from performing its obligations to pay monies previously accrued and owing to the MBTA or, except as expressly provided in this Section 13.1(C), to deposit any Fare Revenue required to be deposited pursuant to Appendix 4.2. Without limiting any other requirement of this Article, the Systems Integrator shall be excused from a failure to meet its obligation to deposit Fare Revenue pursuant Appendix 4.2 solely to the extent such failure directly results from the occurrence of a Compensation Event described under Item (19) of the definition thereof; provided that, no such Compensation Event (or any other Supervening Event) shall serve to excuse the Systems Integrator from its obligation to deposit Fare Revenue held by any Systems Integrator Person at any time (all such Fare Revenues being held only in trust) pursuant to Appendix 4.2.

(D) Mitigation Given Effect. Any relief to which the Systems Integrator is entitled under this Article on account of Supervening Events shall be adjusted to account for the effect of the mitigation measures which were or should have been taken by the Systems Integrator in compliance with its duty to mitigate under Section 25.2.

(E) Applicable Law Compliance. Nothing in this Article shall be interpreted as relieving the Systems Integrator of its obligation, following any and all Supervening Events, to comply with Applicable Law in the performance of its obligations under this Project Agreement.

(F) Contract Services Not Affected; Resumption of Performance. The occurrence of a Supervening Event shall not excuse the Systems Integrator from performing any obligation hereunder not directly affected by the occurrence of the Supervening Event. Upon the occurrence of a Supervening Event, the Systems Integrator shall promptly use all reasonable efforts to eliminate the cause thereof and resume performance of the affected Contract Services.

SECTION 13.2. PROCEDURES RELATING TO SUPERVENING EVENTS.

(A) Notice and Written Report. If the Systems Integrator becomes aware that a Supervening Event has occurred (regardless of whether such event has concluded or is continuing), the

Systems Integrator shall give notice to the MBTA promptly, and in any event no later than 10 Business Days, after the date the Systems Integrator becomes aware of such occurrence. The Systems Integrator's notice shall include a written report:

- (1) Describing the Supervening Event and the cause thereof, to the extent known;
- (2) Stating the date on which the Supervening Event began and its estimated duration;
- (3) Summarizing the consequences of the Supervening Event and the expected impact on the performance of the Systems Integrator's obligations under this Project Agreement; and
- (4) Indicating the nature and scope of the Systems Integrator's potential entitlement to relief under this Project Agreement.

(B) Submittal of Relief Request. The Systems Integrator shall submit to the MBTA a further notice making its request for specific relief, the basis therefor and the event giving rise to the requested relief (the "**Relief Request Notice**"), promptly after becoming aware of such occurrence, but not more than 20 Business Days after the MBTA's receipt of the notice required under Section 13.2(A); provided that, if the specific relief cannot reasonably be ascertained within such period, the Systems Integrator shall furnish the Relief Request Notice within such longer period as is reasonably necessary to detail the event and ascertain such relief; however, in any event, such Relief Request Notice shall be submitted to the MBTA not more than 70 Business Days after the MBTA's receipt of the notice required under Section 13.2(A). Each Relief Request Notice shall include all information required in this Article with respect to the specific relief being requested.

(C) Updates and Additional Information. The Systems Integrator shall provide the MBTA with periodic updates, together with further details and supporting documentation, as it receives or develops additional information pertaining to the Supervening Event and the matters described in Sections 13.2(A) and 13.2(B). In particular, the Systems Integrator shall promptly (in any event within 10 Business Days):

- (1) Notify the MBTA if at any time it becomes aware of any further material information relating to the Supervening Event (including any cessation of the Supervening Event), to the extent such information is new or renders information previously submitted materially inaccurate or misleading; and
- (2) Upon the MBTA's reasonable request, submit to the MBTA additional information related to the Supervening Event and the Systems Integrator's request for relief.

(D) Delay in Notification. The Systems Integrator acknowledges that any delay by the Systems Integrator in submitting to the MBTA any Supervening Event notice or any information required under this Section beyond the applicable time period required under this Section may adversely affect the MBTA, and agrees that the relief to be provided in respect of any Supervening Event shall be reduced or limited to the extent of any such adverse effect, as reasonably determined by the MBTA. The Systems Integrator shall be deemed to have become aware of the occurrence of a Supervening Event if such occurrence could reasonably have been known, identified, discovered or observed by the Systems Integrator through the employment of procedures consistent with Good Industry Practice. Without limiting any of the foregoing, if the Systems Integrator fails to submit a Relief Request Notice 70 Business Days after the MBTA's receipt of the notice required under Section 13.2(A), then the Systems

Integrator shall be deemed to have irrevocably and forever waived and released any and all claim or right with respect to the subject Supervening Event.

(E) Multiple and Overlapping Claims. The Systems Integrator may make multiple but not duplicative claims with respect to the occurrence of a Supervening Event.

(F) Burden of Proof and Mitigation. The Systems Integrator shall bear the burden of proof in establishing the occurrence of a Supervening Event and the entitlement to relief based thereon, and shall demonstrate that the Systems Integrator complied with its mitigation obligations under Section 25.2.

(G) MBTA Response. The MBTA may, but shall have no obligation to, respond to the Systems Integrator's initial notice concerning the occurrence of a Supervening Event under subsection (A) of this Section. Within 15 Business Days after receipt of a Relief Request Notice pursuant to subsection (B) of this Section, the MBTA shall issue a written determination as to the extent, if any, to which it concurs with the Systems Integrator's request and the reasons therefor.

(H) Agreement or Dispute. The agreement of the parties as to the specific relief to be given the Systems Integrator due to the occurrence of a Supervening Event shall be evidenced by a Change Order, Amendment or other written agreement between the Parties. Either Party may refer any dispute regarding a Supervening Event claim to the Dispute Resolution Procedures.

SECTION 13.3. CONDITIONS TO SCHEDULE RELIEF.

(A) Float in the Project Schedule. The Parties acknowledge and agree that "float" in the Project Schedule:

(1) Means the amount of time that any given activity or logically connected sequence of activities shown on the Project Schedule may be delayed before it delays the occurrence of any Key Milestone; and

(2) Is an expiring resource available to the Project for the benefit of both Parties, available to each of them as needed to absorb delays in achieving any Key Milestone, whether such delays are caused by Supervening Events or otherwise.

(B) Required Demonstration for Schedule Relief Pertaining to the Implementation Work. Without limiting any other requirement of this Article, in order to be entitled to any adjustment to the Scheduled Transition Period Completion Date, the Scheduled Full Service Commencement Date or the Longstop Date as a result of the occurrence of a Supervening Event, the Systems Integrator shall demonstrate:

(1) In accordance with the time impact analysis requirements of Appendix 2 (Design and Implementation Requirements), the impact of the Supervening Event on the critical path of planned Implementation Work in the Project Schedule, as updated, maintained and revised by the Systems Integrator in accordance with the Contract Standards, such that the Supervening Event will consume all available float and extend the time required to achieve the scheduled milestone from which relief is being sought;

(2) That the Systems Integrator, in view of all circumstances, exercised all reasonable efforts to avoid the delay; and

- (3) That the delay was not caused by any Systems Integrator Person.

SECTION 13.4. SUPERVENING EVENTS – RELIEF EVENTS AND GENERALLY APPLICABLE RELIEF.

(A) Entitlement to Relief. If the Systems Integrator has complied with its obligations under this Article and demonstrated that a Relief Event has occurred (regardless of whether such event has concluded or is continuing), the Systems Integrator shall be entitled to relief from the performance of the Contract Services, including schedule relief, to the extent that any failure to perform or delay in performing directly results from the occurrence of such Relief Event, subject to the terms and conditions of this Section and all other limitations set forth in this Article.

(B) Schedule Relief Pertaining to Implementation Work. Any schedule relief resulting from the occurrence of a Supervening Event prior to the Full Service Commencement Date shall be limited to a reasonable and equitable adjustment to the Financial Close Deadline and the scheduled completion dates associated with the Key Milestones, as applicable and including the Scheduled Transition Period Completion Date, the Scheduled Full Service Commencement Date (and the resulting adjustment to the Longstop Date by operation of the definition thereof), or, if such event occurs after the Scheduled Full Service Commencement Date and prior to the Longstop Date, the Longstop Date, taking into account:

(1) The impact of the Supervening Event on the critical path of planned Implementation Work in the Project Schedule, as updated, maintained and revised by the Systems Integrator in accordance with the Contract Standards;

(2) Any available float pursuant to Section 13.3(A); and

(3) Any previous or concurrent, unrelated delay for which any Systems Integrator Person is responsible.

(C) Relief from Deductions. Without limiting any other requirement under this Article, in the case of any Supervening Event occurring during the Operating Period:

(1) System Availability Deductions shall not be applied if the associated System Availability Failure is directly attributable to the occurrence of such Supervening Event; and

(2) Performance Deductions shall not be applied if the associated Performance Failure is directly attributable to the occurrence of such Supervening Event.

(D) Monthly Payment Adjustments. If a Supervening Event occurs during the Operating Period, the MBTA shall be entitled to deduct from any Monthly Payment otherwise payable hereunder (after giving effect to subsection (C) of this Section):

(1) The Systems Integrator’s actual avoided cost of Contract Services not being performed as a direct result of the occurrence of such Supervening Event; and

(2) The amount that the Systems Integrator is (or, pursuant to Section 17.1(F), should be) entitled to recover under any “business interruption” coverage under the Available Insurance as a direct result of the occurrence of such Supervening Event.

SECTION 13.5. SUPERVENING EVENTS – COMPENSATION EVENTS.

(A) Entitlement to Relief. If the Systems Integrator has complied with its obligations under this Article and demonstrated that a Compensation Event has occurred (regardless of whether such event has concluded or is continuing), the Systems Integrator shall be entitled to:

(1) Relief from the performance of the Contract Services, including schedule relief, to the extent that any failure to perform or delay in performing directly results from the occurrence of such Compensation Event; and

(2) Compensation for any Change in Costs or Financing Costs that the Systems Integrator will incur as a direct result of the occurrence of such Compensation Event, as well as any additional payment that may be required pursuant to Section 13.6;

in each case, subject to the terms and conditions of this Section and all other limitations set forth in this Article.

(B) Schedule Relief. Section 13.4(B) shall be applicable to any schedule relief resulting from the occurrence of a Compensation Event prior to the Full Service Commencement Date.

(C) Relief from Deductions. Section 13.4(C) shall be applicable in respect of any Compensation Event occurring during the Operating Period.

(D) Adjustments to Availability Payments. Section 13.4(D) shall be applicable in respect of any Compensation Event occurring during the Operating Period.

(E) Information Required for Compensation. Without limiting any other requirement under this Article, in order to be entitled to compensation from the MBTA in respect of a Compensation Event, the Systems Integrator shall provide evidence to the MBTA demonstrating:

(1) That the Compensation Event was the direct cause or is reasonably likely to be the direct cause of any claimed Change in Costs or Financing Costs;

(2) That, in respect of any claimed Financing Costs, the Systems Integrator will actually incur such Financing Costs during a Compensable Delay Period as a direct result of the relevant Compensation Event, including a breakdown of such Financing Costs; and

(3) With respect to any claimed Change in Cost, substantiation of any Change in Cost actually incurred and a detailed description of any Change in Cost likely to be incurred.

(F) Change in Costs. Subject to this Section 13.5 and Section 5.6(A), the MBTA shall pay to the Systems Integrator all Change in Costs actually incurred by it as a direct result of a Compensation Event through one, or any combination, of the following methods, as determined in the discretion of the MBTA (subject to Section 14.5) and calculated in accordance with Section 13.6:

(1) As a direct payment to the Systems Integrator, independent of the Availability Payments, in accordance with a Change Order; provided that any such direct payment shall be made by the MBTA within 60 days of its receipt of a written demand for payment by the Systems Integrator (supported by all relevant information, including all information specified in Section 13.5(E)) which is not disputed;

(2) Through an adjustment to the Availability Payments, which adjustment shall leave the Systems Integrator in a No Better and No Worse position; or

(3) Through an adjustment to the Initial Term (or, if the relevant Compensation Event occurs during a Renewal Term, the applicable Renewal Term), which adjustment shall leave the Systems Integrator in a No Better and No Worse position.

(G) Financing Costs. Subject to this Section 13.5, if a Compensation Event occurs prior to Transition Period Completion (or, if after Transition Period Completion but prior to the Full Service Commencement Date, the Full Service Commencement Date) and any APC Milestone Date is subject to adjustment pursuant to Section 13.4(B), any period commensurate with the number of days added to the applicable APC Milestone Date as a direct result of such Compensation Event shall be a **“Compensable Delay Period”**, and the MBTA shall pay the Systems Integrator the related Financing Costs, less any amount the Systems Integrator is (or pursuant to Section 17.1(F) should be) entitled to recover under any “delay in startup coverage” under the Available Insurance, no later than 45 days after the net amount of such Financing Costs have been agreed to between the Parties or determined in accordance with the Dispute Resolution Procedures; provided that, to the extent that any Financing Costs become due for payment or repayment by the Systems Integrator during any Compensable Delay Period, the MBTA shall pay to the Systems Integrator an amount equal to such Financing Costs no later than five Business Days prior to the date that such Financing Costs become due for payment or repayment by the Systems Integrator pursuant to the Financing Documents.

SECTION 13.6. RECONCILIATION CALCULATION.

(A) Applicability and Calculation. In the event of the occurrence of any Compensable Delay Period, then no later than 45 days after the Full Service Commencement Date, the Parties shall calculate in accordance with Section 14.6 (such calculation, the **“Reconciliation”**) the extent to which the Systems Integrator was left in a position that was No Better and No Worse as a direct result of any Compensable Delay Periods caused by one or more Compensation Events, assuming that any Change in Costs payable under Section 13.5(F) have been or will be paid in accordance therewith and taking into account:

- (1) The payments actually made by the MBTA under Section 13.5(G);
- (2) The actual Financing Costs incurred by the Systems Integrator during the Compensable Delay Periods;
- (3) The Systems Integrator’s actual avoided costs resulting from Contract Services not being performed as a direct result of all such Compensation Events;
- (4) The amount the Systems Integrator is (or pursuant to Section 17.1(F) should be) entitled to recover under any “delay in startup coverage” under the Available Insurance; and
- (5) All other factors specified in Section 14.6.

(B) Worse Position. To the extent that the Reconciliation demonstrates that the Systems Integrator was left in a worse position notwithstanding the payments made to the Systems Integrator by the MBTA pursuant to Section 13.5(G), the MBTA shall, within 45 days following completion of the Reconciliation, either make a lump-sum payment to the Systems Integrator, adjust the Availability Payments to the Systems Integrator or adjust the Term, in either case in an amount equal to that which would result in the Systems Integrator being left in a position that is No Better and No Worse.

(C) Better Position. To the extent that the Reconciliation demonstrates that the Systems Integrator was left in a better position as a result of the payments made to the Systems Integrator by the MBTA pursuant to Section 13.5(G), the Systems Integrator shall make a lump-sum payment to the MBTA or the MBTA shall adjust the Availability Payments to the Systems Integrator, in either case in an amount equal to that which would result in the Systems Integrator being left in a position that is No Better and No Worse.

SECTION 13.7. FORCE MAJEURE EVENTS.

(A) Effect of Force Majeure on Obligations. Neither Party shall be entitled to bring a claim for a breach of obligations under this Project Agreement by the other Party or incur any liability to the other Party for any losses or damages incurred by that other Party to the extent that a Force Majeure Event occurs and the Affected Party is prevented from carrying out obligations by that Force Majeure Event. During the continuance of any Force Majeure Event, the Affected Party shall be excused from performing those of its obligations directly affected by such Force Majeure Event; provided, that the occurrence or continuance of any Force Majeure Event shall not excuse any Party from performing any payment obligations contemplated under this Project Agreement.

(B) Systems Integrator as Affected Party. Without limiting any obligation under this Section 13.7, if the Systems Integrator is an Affected Party, the Systems Integrator's obligations in respect of the relevant Force Majeure Event shall be as set forth in this Article 13 (Supervening Events) in respect of any Relief Event.

(C) MBTA as Affected Party. If the MBTA is an Affected Party, the MBTA shall promptly (no later than 10 Business Days after the date the MBTA becomes aware of the occurrence of a Force Majeure Event) notify the Systems Integrator of the occurrence of such Force Majeure Event, which notice shall include:

- (1) The date of its commencement;
- (2) Its effect on the obligations of the MBTA hereunder; and
- (3) Any action proposed by the MBTA to mitigate its effect.

(D) Consultation. As soon as practicable following notification of any Force Majeure Event, the Parties shall consult with each other in good faith and use all reasonable efforts to agree on appropriate terms to mitigate the effects of the Force Majeure Event and facilitate the continued performance of this Project Agreement.

(E) Notice of Cessation. The Affected Party shall notify the other Party as soon as practicable after the Force Majeure Event ceases or no longer causes the Affected Party to be unable to comply with its obligations under this Project Agreement.

SECTION 13.8. CHANGES IN PAYMENT INDUSTRY STANDARDS.

(A) Entitlement to Relief. Without limiting any other requirement of this Article or any right of either Party under the Dispute Resolution Procedures, a Change in Payment Industry Standards shall be a Compensation Event to the extent the Systems Integrator demonstrates, with verification through a written report prepared by an independent third party reasonably acceptable to the MBTA (subject to Section 13.8(B)), that:

(1) Such Change in Payment Industry Standards requires a Capital Expenditure in respect of any Device or CN Equipment and cannot be addressed through the employment of compensating controls in accordance with Good Industry Practice without such Capital Expenditure;

(2) The need for such Capital Expenditure is not the result of Systems Integrator Fault; and

(3) Any Change in Cost claimed by the Systems Integrator in respect of such Change in Payment Industry Standards is reasonable, as determined by reference to Good Industry Practice, and the direct result of such Change in Payment Industry Standards.

(B) Independent Third Party. Any independent third party preparing a report pursuant to Section 13.8(A) shall:

(1) Be suitably qualified and experienced, as determined by reference to Good Industry Practice, to prepare such report; and

(2) Be financially independent of all Systems Integrator Persons, owe a duty of care to both the MBTA and the Systems Integrator jointly and act impartially and independently of the MBTA and the Systems Integrator in performing the services contemplated by this Section 13.8.

A failure of compliance with the requirements of this Section 13.8(B) shall be the sole grounds for any determination by the MBTA that such independent third party is unacceptable. Any independent third party engaged by the Systems Integrator pursuant to this Section 13.8 shall be provided access to Proprietary Intellectual Property to the extent necessary to make its determinations and prepare its report, which access may be subject to commercially reasonable confidentiality restrictions to protect the confidentiality and proprietary nature of the Proprietary Intellectual Property. The Systems Integrator shall bear all cost and expense of the services performed by any independent third party pursuant to this Section 13.8; provided that, if it is determined that the relevant Change in Payment Industry Standards is a Compensation Event pursuant to this Section 13.8, such cost and expense shall be included in the Change in Cost payable to the Systems Integrator in respect of such Compensation Event.

ARTICLE 14

FINANCING AND REFINANCING

SECTION 14.1. SYSTEMS INTEGRATOR RESPONSIBILITY TO FINANCE THE PROJECT.

(A) Systems Integrator Financing. Without limiting any responsibility of the MBTA under Appendix 14 (Financial Close Procedures and Conditions), the Systems Integrator is solely responsible for obtaining and repaying all financing necessary for the Project at its own cost and risk and without recourse to the MBTA. Except as expressly set forth in Appendix 14 (Financial Close Procedures and Conditions), the Systems Integrator exclusively bears the risk of any changes in the interest rate, credit spreads, payment provisions, collateral requirements, finance charges, or the other terms and conditions of its financing. Subject to the terms and conditions of this Article and Appendix 14 (Financial Close Procedures and Conditions), the MBTA shall use reasonable efforts to provide assistance to the Systems Integrator in connection with its efforts to achieve Financial Close.

(B) Systems Integrator Liability. Notwithstanding any foreclosure or other enforcement of any security interest created by any Financing Document, the Systems Integrator shall remain liable to the MBTA for the payment of all sums owing to the MBTA under this Project Agreement and the performance and observance of all of the Systems Integrator's covenants and obligations under this Project Agreement.

SECTION 14.2. DEBT NON-RECOURSE TO MBTA.

All debt obligations issued or incurred by the Systems Integrator in connection with this Project Agreement or the Project, including the Project Debt, shall be issued or incurred only in the name of the Systems Integrator. The MBTA shall have no obligation to pay debt service on any Project Debt or other debt obligations, or to join in, execute or guarantee any note or other evidence of indebtedness of the Systems Integrator, including any Financing Document; provided that, the MBTA shall enter into the Lenders' Remedies Agreement on the Financial Close Date.

SECTION 14.3. FINANCING DOCUMENTS.

(A) Restrictions and Mandatory Terms. No Security Document or other instrument purporting to mortgage, pledge or encumber, or create a lien, charge or security interest in, on or against, the Systems Integrator's interest in, or rights or obligations under, this Project Agreement shall extend to or affect the MBTA's right, title and interest in the Project or the MBTA's rights or interests under this Project Agreement. Each Financing Document shall:

- (1) Include an acknowledgement and agreement as to this Section 14.3(A), Section 14.2, Section 8.2(B)(3), Section 8.4(B)(3), Section 11.4(A)(3) and Section 15.1;
- (2) Provide that any grant, assignment, mortgage, pledge, encumbrance, lien, charge, or security interest made or created in violation of this Section 14.3(A) Section 8.2(B)(3), Section 8.4(B)(3), Section 11.4(A)(3) or Section 15.1 shall be null and void;
- (3) Not otherwise contain terms that are contrary to or inconsistent with the express terms of this Project Agreement; and

(4) Provide that any amendment or waiver of such Financing Document that would result in a violation of this Section 14.3(A) shall be null and void without the express written consent of the MBTA.

(B) Compliance with Financing Documents. The Systems Integrator shall keep the Financing Documents in good standing to the extent necessary to perform its obligations under this Project Agreement and will ensure that none of the terms and conditions of the Financing Documents will prevent the Systems Integrator from performing its obligations under this Project Agreement. If at any time the Systems Integrator receives a notice that an “event of default”, any event entitling the Lenders to enforce any security or any other similar event has occurred under the Financing Documents, the Systems Integrator shall immediately deliver to the MBTA a copy of such notice.

(C) Delivery of Changed Financing Documents. Without limiting any other requirement of this Article 14 (Financing and Refinancing), at any time any amendment is made to any Financing Document or the Systems Integrator enters into any new Financing Document (or any agreement which affects the interpretation or application of any Financing Document), the Systems Integrator shall deliver to the MBTA a copy of each such amendment or agreement within 10 Business Days of the date of its execution or creation, certified as a true copy by an officer of the Systems Integrator.

SECTION 14.4. REFINANCING.

(A) Qualifying Refinancing. The Systems Integrator shall not enter into any Qualifying Refinancing without the prior written consent of the MBTA. Such consent shall not be unreasonably withheld or delayed if such Qualifying Refinancing occurs after the Full Service Commencement Date, has no material and adverse effect on the Systems Integrator's ability to perform its obligations under this Project Agreement and does not increase any liability or potential liability of the MBTA.

(B) MBTA's Share of Refinancing Gain. The MBTA shall be entitled to receive a 50 percent share of any Refinancing Gain arising from a Qualifying Refinancing. The MBTA may not condition its consent to any Qualifying Refinancing upon receiving greater than a 50 percent share of the Refinancing Gain.

(C) Systems Integrator Proposal to Refinance. The Systems Integrator shall provide the MBTA with full details of any proposed Qualifying Refinancing and a reasonable opportunity to review all related information (not less than 30 Business Days), which shall include:

(1) Details concerning any changes to the Systems Integrator's obligations to the Lenders, including proposed revisions to the Financing Documents and any proposed additional Financing Documents;

(2) A copy of the proposed Financial Model relating to the Qualifying Refinancing;

(3) The basis for the assumptions and calculations used in such proposed Financial Model; and

(4) The estimated share of the MBTA's Refinancing Gain, expressed in terms of both a lump sum payment and as an adjustment to Availability Payments over the Term.

(D) Audit Rights. The MBTA shall (before, during and at any time after any Qualifying Refinancing) have unrestricted rights of audit over any proposed Financial Model, books, records and other documentation (including any aspect of the calculation of the Refinancing Gain) used in connection with such Qualifying Refinancing.

(E) Payment to the MBTA. The MBTA may elect to receive its share of any Refinancing Gain as:

(1) A single lump sum payment (not to exceed 50% of such Refinancing Gain, and not to exceed the net cash proceeds of Refinancing received by the Systems Integrator or available prior to the making of any Distribution), to be paid promptly and in any event not later than five Business Days following the relevant Distribution;

(2) A reduction in Availability Payments over the remainder of the Initial Term (up to a maximum equal to the APC otherwise payable to the Systems Integrator each Month during such period); or

(3) A combination of (1) and (2).

(F) Calculation of Refinancing Gain. Subject to Section 14.4(A), following the Systems Integrator's delivery of the details regarding a proposed Qualifying Refinancing pursuant to Section 14.4(C), the Parties will negotiate in good faith to agree on the amount of the Refinancing Gain resulting from such Qualifying Refinancing and the basis of payment of the MBTA's share of the Refinancing Gain. If the Parties fail to agree on the determination of the Refinancing Gain or the payment of the MBTA's share, either Party may elect to initiate the Dispute Resolution Procedures.

(G) Costs of Refinancing. The Refinancing Gain shall be calculated after taking into account the reasonable and proper professional costs that each Party directly incurs in relation to the Qualifying Refinancing and on the basis that the Systems Integrator will be responsible for the payment of all reasonable and proper professional costs incurred by the MBTA in connection with the activities contemplated by this Section 14.4. Such costs shall be paid to the MBTA by the Systems Integrator within 30 Days following any Qualifying Refinancing, even if the Refinancing Gain is determined to be zero.

(H) Notice of any Other Refinancing. Without limiting any other provision of this Article 14 (Financing and Refinancing), the Systems Integrator shall notify the MBTA of any Refinancing that is not a Qualifying Refinancing promptly upon becoming aware of the potential of any such Refinancing and again upon entering into any such Refinancing.

(I) No Increased Termination Liabilities. Notwithstanding any other provision of this Project Agreement, no Refinancing (other than an Exempt Refinancing described in clauses (1), (5) or (6) of the definition thereof) or waiver or exercise of a right under any Financing Document shall have the effect of increasing the potential maximum amount of the MBTA's liabilities in respect of any Termination Amount (as indicated in the Financial Model), unless the Systems Integrator has obtained the prior written consent of the MBTA to such increased liability for the purposes of this Section 14.4(I). The MBTA shall not be liable for or required to pay any increased amount incurred by the Systems Integrator in contravention of this Section 14.4(I).

SECTION 14.5. FINANCING OF COSTS FOR WHICH THE MBTA IS RESPONSIBLE.

(A) Additional Financing. Subject to Section 11.4, the Systems Integrator, if requested by the MBTA, shall use all reasonable efforts to obtain financing necessary in order to enable the MBTA to pay amounts in respect of an MBTA Change or other Compensation Event on a deferred basis, through an adjustment to the Availability Payments, an extension of the Term or otherwise. Any such financing shall be on terms and conditions acceptable to the MBTA and the Systems Integrator, each acting reasonably. Notwithstanding the foregoing, if the Systems Integrator reasonably determines that it will be unable to obtain financing pursuant to this Section 14.5(A) and provides written notification to the MBTA, including the basis of such reasonable determination, the Systems Integrator shall be deemed to have satisfied its obligation under this Section 14.5(A).

(B) Failure to Obtain Additional Financing. If the Systems Integrator is unable to obtain additional financing at the request of the MBTA in accordance with Section 14.5(A) or the MBTA does not accept the terms under which the Systems Integrator is able to obtain such additional financing, the MBTA shall pay any required compensation directly to the Systems Integrator, independent of and without any adjustment to the Availability Payments, extension of the Term or other deferment, in accordance with the terms and conditions of this Project Agreement.

(C) Additional Financing and Deferred Compensation. If and to the extent that the Systems Integrator obtains additional financing at the request and with the consent of the MBTA in accordance with Section 14.5(A), the Systems Integrator shall be entitled to additional compensation to the extent necessary to leave the Systems Integrator in a position that is No Better and No Worse.

SECTION 14.6. FINANCIAL MODEL.

(A) Risk of Errors or Omissions. The Systems Integrator shall bear the entire risk of any errors in or omissions from the Financial Model, including any adjustments thereto, and shall not be entitled to any compensation or other relief from, or redress against, the MBTA in relation to any loss or damage that it suffers in consequence of any such error or omission.

(B) No Guaranteed Return. In no event shall the agreement of the Parties to establish and maintain the Financial Model for certain purposes hereunder, including any adjustments to the Financial Model in accordance with this Section 14.6 or pursuant to Section 14.4, be construed to mean that the Systems Integrator is entitled to receive a guaranteed rate of return on equity invested in connection with the Project.

(C) Use in Connection with Compensation Events. Whenever a Compensation Event occurs (except as otherwise provided in this Project Agreement or where the Parties mutually agree otherwise), the Systems Integrator, in consultation with the MBTA, shall use the Financial Model to calculate and reflect the impact of such Compensation Event in accordance with Article 13 (Supervening Events). In calculating any Change in Costs, Financing Costs and in assessing other adjustments to be made to the Financial Model arising from a Compensation Event, the Systems Integrator shall not be entitled to take into account the financial impact up to or after the date of the Compensation Event of those risks which the Systems Integrator bears under the terms of this Project Agreement, including (to the extent borne by the Systems Integrator under this Project Agreement) changes in taxation rates, inflation and the impact of any Deductions made by the MBTA pursuant to Appendix 8 (Payment Mechanism).

(D) No Better and No Worse. Any reference in this Project Agreement to “**No Better and No Worse**” shall be construed by reference to the Systems Integrator’s:

(1) Rights, duties and liabilities under or arising pursuant to performance of this Project Agreement, the Financing Documents and the Material Contracts;

(2) Risks borne by the Systems Integrator under the terms and conditions of this Project Agreement; and

(3) Ability to perform its obligations and exercise its rights under this Project Agreement, the Financing Documents and the Material Contracts, so as to ensure that:

(a) The Systems Integrator is left in a position which is financially no better and no worse in relation to the Key Ratios and the Equity IRR (as determined by reference to the version of the Financial Model applicable immediately prior to the Compensation Event) than had the Compensation Event not occurred; and

(b) The ability of the Systems Integrator to comply with this Project Agreement is not adversely affected or improved as a consequence of the Compensation Event.

(E) Changes to Financial Model Logic and Formulae. In no event shall the Financial Model logic or formulae be changed except with the prior written agreement of both Parties, each acting reasonably and recognizing that such changes may be necessary to permit calculations or adjustments pursuant to this Section. If any amendment is to be made to the logic or formulae incorporated in the Financial Model, the Financial Model shall first be run immediately prior to the making of any such amendment to ensure that the Key Ratios from the Financial Model are maintained at levels that are neither lower nor higher than the Key Ratios existing immediately after making such amendment, and the difference in the Equity IRR after and immediately prior to making such amendment does not differ by more than one basis point (being 0.01%).

(F) Audit of Financial Model. In connection with any adjustments made to the Financial Model, including amendments to the logic or formulae incorporated in the Financial Model under subsection (E) of this Section, and as a condition to the MBTA providing approval for any amended version of the Financial Model, the Systems Integrator shall (at its own cost) deliver to the MBTA an audit of such amended version of the Financial Model from an independent audit firm with a nationally recognized reputation.

(G) Access and Approval. The MBTA shall have the right at all times to gain access, on an open book basis, to the Financial Model and each revision thereto, including all assumptions and other data that form part of each such model and revision. The MBTA shall have the right to approve any amendment or revision to the Financial Model pursuant to this Section 14.6 or Section 14.4, which approval shall not be construed to transfer any risk borne by the Systems Integrator hereunder to the MBTA. The Systems Integrator grants the MBTA a license to use the Financial Model for any purpose in connection with this Project Agreement or the Project, which license shall commence upon the initial delivery of the Financial Model and shall continue until the later of the Expiration Date and the date of full settlement of all claims either Party may have against the other.

(H) Revised Financial Model. Following any adjustment to the Financial Model under the provisions of this Section 14.6 or 14.4, the Systems Integrator shall promptly deliver a copy of the revised Financial Model to the MBTA in the same form as the versions delivered as a condition to

Financial Close, and in the same manner, or in such other form and manner as may be agreed between the Parties. Upon the approval of the MBTA, such revised Financial Model shall become the Financial Model for all purposes under this Project Agreement until any further amendment or adjustment is approved by the MBTA.

ARTICLE 15

ASSIGNMENT AND CHANGE IN CONTROL

SECTION 15.1. ASSIGNMENT BY SYSTEMS INTEGRATOR.

(A) Restrictions. The Systems Integrator shall not assign, transfer or otherwise dispose of any interest in this Project Agreement or a Project Contract except:

(1) As security for any loan made to the Systems Integrator under any Funding Agreement and provided the Lenders enter into the Lenders' Remedies Agreement and all related Financing Documents are in compliance with Section 14.3;

(2) In connection with the exercise of rights of the Lenders under the Financing Documents in accordance with the Lenders' Remedies Agreement; or

(3) Otherwise:

(a) Prior to the day that is two years after the Full Service Commencement Date (the "**Transfer Restriction Date**"), with the prior written consent of the MBTA, which may be given or withheld in the MBTA's discretion; and

(b) After the Transfer Restriction Date, with the prior written consent of the MBTA, which will not be unreasonably withheld or delayed;

provided that, in the case of an assignment under subsections (2) or (3) of this Section, the assignee assumes all the obligations of the Systems Integrator under this Project Agreement.

(B) Factors the MBTA May Consider. In determining whether to provide its consent under Section 15.1(3)(b), it will be reasonable for the MBTA to refuse its consent if:

(1) The proposed assignee, or any of its Affiliates, is a Restricted Person;

(2) The proposed assignment would violate the provisions of M.G.L. c. 268A or any other Applicable Law; or

(3) The proposed assignment could, in the reasonable opinion of the MBTA, have a material and adverse effect on the MBTA, the Project or the ability of the Systems Integrator to meet its obligations under this Project Agreement.

SECTION 15.2. LIMITATIONS ON CHANGE IN CONTROL.

(A) Change in Control Defined. For purposes of this Project Agreement "**Change in Control**" means with respect to a person any direct or indirect change in the ownership or control of any legal, beneficial or equitable interest in any or all of the shares, units or equity in the person (including the control over the exercise of voting rights conferred on equity share capital, unit interests or equity interests or the control over the right to appoint or remove directors, a general partner, a managing member or other managers), including changes arising from assignment or transfer of existing shares, units or equity, issuance of new shares, units or equity or amalgamation, merger consolidation, amendment of a limited partnership certificate or other reorganization, or any other direct or indirect

change which results in a person or group of persons, other than the equity holders of the entity immediately prior to the change, directly or indirectly:

(1) Controlling the composition of the majority of the board of directors of the entity or of a general partner or manager of the entity;

(2) Controlling the decisions made by or on behalf of the person, including by controlling the voting power of the board of directors or by controlling the voting power of any class of shareholders or equity holders of any of the entity, a general partner of the entity or a manager of the entity or otherwise;

(3) Holding equity (either beneficially or otherwise) of that entity with a subscribed value (taking into account contributions to be made in the case of a limited partnership) of more than one half of the subscribed value (taking into account contributions to be made in the case of a limited partnership) or equity (either beneficially or otherwise) of that entity with more than one half of the voting rights; or

(4) Having the ability to direct or cause the direction of the management, actions or policies of the entity.

(B) Limitations. No Change in Control of the Systems Integrator shall be permitted (whether by the Systems Integrator or otherwise) to occur except:

(1) In connection with the exercise of rights of the Lenders under the Financing Documents in accordance with the Lenders' Remedies Agreement;

(2) Arising from any bona fide open market transaction in any shares or other securities of the Systems Integrator or of any Equity Member effected on a recognized public stock exchange;

(3) Arising from a transfer of interests between managed funds that are under common ownership or control or between the general partner, manager or the parent company of such general partner or manager and any managed funds under common ownership or control with such general partner or manager (or parent company of such general partner or manager), or a transfer of an interest, direct or indirect, in an Equity Member to a fund where the parent company of the general partner, manager or investment adviser of the fund is also the parent company of the Equity Member; provided, that the relevant funds and the general partner, manager or investment adviser of such funds (or the parent company of such general partner, manager or investment adviser) have been approved by the MBTA in writing prior to the Effective Date, and, for this purpose, "investment adviser" means an entity with the typical responsibilities of a fund manager except that key investment portfolio and risk management decisions are reserved to the independent board of directors of the relevant fund;

(4) Otherwise:

(a) Prior to the Transfer Restriction Date, with the prior written consent of the MBTA, which may be given or withheld in the MBTA's discretion; and

(b) After the Transfer Restriction Date, with the prior written consent of the MBTA, which will not be unreasonably delayed and shall be given unless:

(i) The MBTA reasonably determines that the proposed Change in Control could have a material and adverse effect on the MBTA, the Project or the ability of the Systems Integrator to meet its obligations under this Project Agreement;

(ii) The proposed Change in Control would violate the provisions of M.G.L. c. 268A or any other Applicable Law; or

(iii) The proposed Change in Control would result in a Restricted Person becoming an Affiliate of the Systems Integrator.

SECTION 15.3. LIMITATION ON ASSIGNMENT BY THE MBTA.

The MBTA shall not assign, transfer or otherwise dispose of any interest in this Project Agreement except:

(1) To another Governmental Body of the Commonwealth which:

(a) Assumes, and is legally capable of discharging, all of the obligations of the MBTA under this Project Agreement; and

(b) Has at least the same or equivalent financial capacity with respect to satisfying the payment obligations of the MBTA under this Project Agreement as was the case immediately prior to the assignment, transfer or other disposition; or

(2) With the prior written consent of the Systems Integrator, which consent shall not be unreasonably withheld.

SECTION 15.4. COSTS OF REQUEST FOR CONSENT.

If the Systems Integrator requests consent to an assignment, transfer or disposition pursuant to Section 15.1 or to a Change in Control pursuant to Section 15.2, the Systems Integrator shall pay the MBTA's reasonable internal administrative and personnel costs and all out-of-pocket costs reasonably incurred by the MBTA in connection with the MBTA's consideration of any such request. At the time of the request, the Systems Integrator shall make a payment to the MBTA in the amount of \$25,000 (Index Linked) against the Systems Integrator's obligation under this Section. Within 15 days following the rendering of a decision by the MBTA in respect of the request, the MBTA shall either refund any over payment or invoice the Systems Integrator for any additional amounts due to the MBTA under this Section. The Systems Integrator shall pay any such additional amount within 30 days following receipt of the MBTA's invoice.

ARTICLE 16

INTELLECTUAL PROPERTY RIGHTS

SECTION 16.1. TRANSFERRED WORK PRODUCT.

(A) “Works Made for Hire”. The term **“Proprietary Work Product”** means Work Product that meets the following criteria: the Work Product (i) is unique to the MBTA or MBTA Activities, and (ii) cannot be reused or re-purposed without disclosing MBTA Confidential Information. All Proprietary Work Product shall be considered “works made for hire” pursuant to Applicable Law and, accordingly, shall be the property of the MBTA (including applicable Intellectual Property Rights of the Systems Integrator Persons that developed the Proprietary Work Product), excluding only (1) the Financial Model, and (2) any COTS or Open Source Software incorporated in any Proprietary Work Product (collectively, the **“Excluded Elements”**).

(B) Assignment. In the event and to the extent that:

(1) Title to the Intellectual Property Rights in any Proprietary Work Product, including any part or element thereof (other than Excluded Elements), may not, by operation of law, vest in the MBTA; or

(2) Any element of any Proprietary Work Product that is protected or protectable by an Intellectual Property Right that is owned Systems Integrator Persons that developed the Proprietary Work Product, including any part or element thereof (other than Excluded Elements), is not, as a matter of law, a “work made for hire” within the meaning of Applicable Law for the sole benefit of the MBTA; then,

The Systems Integrator hereby conveys, transfers and assigns to the MBTA all of the Systems Integrator's right, title and interest, and shall cause all relevant Systems Integrator Persons to convey, transfer and assign to the MBTA all of the relevant Systems Integrator Persons' right, title, and interest, throughout the world and without further consideration, in and to all Intellectual Property rights in, as applicable, such Proprietary Work Product, or such part or element thereof, on the earlier of the date that such work is first fixed in a tangible medium of expression or is otherwise protected or protectable by an Intellectual Property Right.

(C) No Joint Ownership. The Parties understand and agree that, unless otherwise agreed in writing by a Systems Integrator Person and the MBTA (in a form approved by the MBTA Legal Department) prior to such creation, in no event shall any Systems Integrator Person be deemed a joint owner of any Proprietary Work Product that is owned by, or conveyed, transferred and assigned to, the MBTA pursuant to this Section 16.1.

(D) Contracting for Work Product. Before commencing the development of any Proprietary Work Product (other than Excluded Elements), the Systems Integrator shall first obtain a written undertaking and commitment from each person involved with such development, confirming and committing to the terms and conditions set forth in this Section 16.1.

(E) Delivery and Unrelated Use. Subject to Section 16.4, the Systems Integrator shall deliver (and shall cause any other Systems Integrator Person to convey, transfer and assign to the MBTA) all of its and their interests in Proprietary Work Product to the MBTA as and when required by the terms of this Project Agreement or when otherwise reasonably requested by the MBTA. The

MBTA's use of any Proprietary Work Product for any purpose other than the Project shall be at its own risk, and the Systems Integrator shall have no liability for or relating to any such use.

(F) Standard Work Product. The Systems Integrator hereby agrees that all Work Product other than Proprietary Work Product (“**Standard Work Product**”) is subject to the license granted to the MBTA in this Article 16. The MBTA acknowledges that, as between the Parties and subject to the grant of rights set out herein, the Systems Integrator owns all right, title and interest in and to the Standard Work Product, including all associated Intellectual Property Rights.

SECTION 16.2. SYSTEMS INTEGRATOR INTELLECTUAL PROPERTY OWNERSHIP.

As between the MBTA and any Systems Integrator Person, and subject to the terms and conditions of this Project Agreement, including the licenses granted and interest conveyed pursuant to this Article 16, the Systems Integrator (or the applicable Systems Integrator Person) retains all right, title and interest in and to its and their Intellectual Property.

SECTION 16.3. THIRD PARTY SYSTEM ELEMENTS.

(A) Necessary Rights to Third Party System Elements. Subject to this Section 16.3 and Section 16.7(B), the Systems Integrator shall obtain all necessary rights and licenses to all Third Party System Elements (including Third Party Software and supporting Documentation) used or necessary to install, operate, maintain, repair and manage the System during the Term and to perform the Contract Services. Without limiting any obligation hereunder, the Systems Integrator shall (and shall cause any other Systems Integrator Person to):

- (1) Use Third Party System Elements that constitute COTS or Open Source Software that are identified in Appendix 6 (Proposal Extracts – Technical Information);
- (2) Refrain from using Third Party System Elements that are not identified in Appendix 6 (Proposal Extracts – Technical Information) unless the MBTA, acting reasonably, has first granted its prior written consent to such use;
- (3) Obtain for each Third Party System Element all rights and licenses, including any licenses necessary for supporting Documentation, on terms that are in accordance with Good Industry Practice and that permit the full operation and maintenance of the System as contemplated by this Project Agreement;
- (4) Without limiting its obligation under Item (3), obtain license terms that:
 - (a) Permit the Systems Integrator to use Third Party System Elements to operate, maintain, access, and use the System during the Term;
 - (b) Permit the MBTA and any MBTA Person to use Third Party System Elements to access and use the System for MBTA Activities during the Term, including to operate and maintain the System during any Step-In Period;
 - (c) Contain software maintenance and support obligations that obligate the applicable vendor or its affiliates to provide maintenance and support for the Third Party System Element during the Term in accordance with Good Industry Practice; and

(d) Contain such other terms and conditions that are typically addressed in Intellectual Property license agreements based on generally prevalent industry standards relevant to System Elements; provided that:

(e) The Parties acknowledge that the license terms set out in this Section 16.3(A)(4) are descriptive with respect to those rights that the Systems Integrator is obligated to obtain pursuant to this Project Agreement, and the Parties agree that the Systems Integrator shall be deemed to have fulfilled its obligations with respect to securing the license terms set out in this Section 16.3(A)(4) if the rights secured are functionally identical to those license terms described in this Section 16.3(A)(4), regardless of whether the license terms set out in the applicable agreement are, in fact, identical to those license terms set out in this Section 16.3(A)(4);

(5) Ensure that the MBTA's rights hereunder (except those in and to COTS and Open Source Software) are not limited by any licensing restrictions addressing COTS and Open Source Software; and

(6) Provide the MBTA with copies of all licenses obtained by the Systems Integrator or any other Systems Integrator Person pursuant to this Section 16.3 upon request.

(B) Source Code. The Systems Integrator shall provide (and shall cause Project Contractors and Subcontractors to provide) Source Code and Documentation for all (i) Third Party Software (to the extent that the Systems Integrator, after exercising all reasonable efforts, has access to such related Source Code and Documentation), and (ii) for all System APIs. The Systems Integrator shall provide such required Source Code and Documentation as further set out herein, including in Section 16.4(J).

(C) Changes to System Elements. The Systems Integrator acknowledges the MBTA's goal of ensuring that the System utilizes COTS elements to the greatest extent reasonably practicable. To this end, the Systems Integrator shall provide the MBTA with a complete list of all COTS elements and Third Party Software comprising the System no later than five days prior to the Revenue Service Commencement Date. The Systems Integrator agrees that, throughout the Term following the Revenue Service Commence Date, it shall not substitute or remove from the System any COTS material or Third Party Software included on such list without first receiving the MBTA's prior written approval for such substitution or removal, which approval shall not be unreasonably withheld.

SECTION 16.4. SOFTWARE ESCROW.

(A) Escrow Agreement. No later than 60 days following the Effective Date, the Systems Integrator and the MBTA, each acting reasonably, shall select a mutually agreeable escrow company engaged in the business of receiving and maintaining escrows of source code and source code documentation (the "**Escrow Agent**") and enter into with an MBTA-approved three party escrow agreement with the Escrow Agent (the "**Escrow Agreement**") in order to establish an escrow for the Requisite Deposit Materials (the "**Software Escrow**") in accordance with this Section 16.4. The Systems Integrator shall be solely responsible for all fees and costs payable to the Escrow Agent under the Escrow Agreement. If the MBTA and the Systems Integrator are unable to agree on the Escrow Agent within 60 days following the Effective Date, then the MBTA shall have the unilateral right to select an Escrow Agent, provided that the same is an established Escrow Agent (e.g., Iron Mountain).

(B) Requisite Deposit Materials. The following shall constitute the “**Requisite Deposit Materials**” to be delivered to the Escrow Agent for deposit, retention, upkeep and release of the Software Escrow in accordance with the Escrow Agreement and this Section 16.4:

- (1) Source Code relating to all SI System Elements;
- (2) Source Code relating to all Third Party System Elements to the extent the Systems Integrator has rights in, or access to, such Source Code pursuant to Section 16.3;
- (3) Documentation and a licensed copy of all Software tools such as debuggers, assemblers and compilers needed to convert the Source Code included in the Requisite Deposit Materials into executable form used by the target processors and procedures necessary to transfer executable code to operational systems, as well as configuration documentation to set up the environment to generate the target for the executable Source Code;
- (4) Hardware devices, such as EPROM programmers, with their accompanying firmware and Software tools, necessary to transfer the executable programs onto the storage device used by any embedded microprocessor;
- (5) Documentation that provides for all Source Code included in the Requisite Deposit Materials the following categories of information (as applicable):
 - (a) General descriptions and operations;
 - (b) Architecture and basic program functions;
 - (c) Data flow information;
 - (d) Detailed memory map and listing; and
 - (e) Input/output port map; and
- (6) All other Deliverables that meet the following criteria: the Deliverable:
 - (a) Is proprietary to the Systems Integrator;
 - (b) Is necessary or advisable for use in connection with the MBTA’s continuing exercise of its rights in accordance with this Article 16; and
 - (c) Is not required to be provided to the MBTA hereunder other than in connection with any MBTA Step-In Action or on any Termination Date.

(C) Quality of Source Code. The Systems Integrator shall ensure that all Source Code included in the Requisite Deposit Materials:

- (1) Is in a form such that a programmer of ordinary skill in the applicable programming language(s) is able efficiently to print, display and read;
- (2) Includes Source Code listings, Object Code listings, design details, flow charts and related materials that permit the related Software to be efficiently copied, maintained, updated, improved and compiled;

(3) Includes related libraries, other source components, compilers and linkers so that, when compiled, linked and otherwise manipulated to create the runtime/executable image for the related Software, such materials create a complete and fully operational run-time/executable version of the Software;

(4) Contains good and sufficient programmers' comments; and

(5) Constitutes the preferred form of the Source Code for making modifications to such Source Code; and

(6) Is otherwise consistent with Good Industry Practice in all respects.

(D) Delivery of Requisite Deposit Materials. Prior to the delivery of any Requisite Deposit Materials to the Escrow Agent, including any supplements or replacements thereof, the Systems Integrator shall conspicuously label for identification each document, magnetic tape, disk and other tangible media upon which the Requisite Deposit Materials are written or stored. The Systems Integrator shall deliver the Requisite Deposit Materials to the Escrow Agent in accordance with the following:

(1) Within 30 days following the introduction of any Source Code constituting any part of the Requisite Deposit Materials into a production environment for the System, the Systems Integrator shall deliver such Source Code and all related Requisite Deposit Materials to the Escrow Agent;

(2) Within 15 days following any upgrades or modifications, including new versions, service packs, patches and other enhancements, relating to any Source Code constituting any part of the Requisite Deposit Materials, the Systems Integrator shall deliver to the Escrow Agent all supplements or replacements of the affected Requisite Deposit Materials that are required in accordance with Good Industry Practice and this Section 16.4; and

(3) Without limiting any of the foregoing, the Systems Integrator shall ensure that:

(a) All Requisite Deposit Materials representing the System as constituted on the Revenue Service Commencement Date are delivered to the Escrow Agent no later than five days prior to the Revenue Service Commencement Date; and

(b) All Requisite Deposit Materials representing the System as constituted on the Full Service Commencement Date are delivered to the Escrow Agent no later than five days prior to the Full Service Commencement Date.

(E) Inventory List and Certification. The Systems Integrator shall:

(1) Provide the MBTA with a written list of all System Elements that are subject to the Software Escrow prior to execution of the Escrow Agreement;

(2) Update such list in connection with each delivery of Requisite Deposit Materials to the Escrow Agent, including any supplements or replacements thereof, to reasonably identify all materials included in the Software Escrow;

(3) Be solely responsible for ensuring that the Software Escrow is complete, accurate and in compliance with the requirements of this Section 16.4 at all times; and

(4) Provide certification of its compliance with this Section 16.4 to the MBTA with each Monthly Payment invoice.

(F) Inspection and Verification. The Systems Integrator shall notify the MBTA at least three Business Days prior to any delivery of Requisite Deposit Materials to the Escrow Agent. The MBTA shall have the right to require the Escrow Agent, at the sole cost and expense of the Systems Integrator, to inspect such Requisite Deposit Materials and verify to the MBTA that such Requisite Deposit Materials meet the requirements of this Section 16.4. In addition, the MBTA shall have the right, at any time, to engage an independent, third-party reviewer to inspect the Software Escrow, including all Requisite Deposit Materials, to verify compliance with the requirements of this Section 16.4; provided that:

(1) Any such third-party reviewer shall be required to enter into a non-disclosure agreement that is substantially similar to the MBTA Standard Non-Disclosure Agreement in all material respects, if requested by the Systems Integrator, to protect the confidentiality and proprietary nature of the contents of the Software Escrow; and

(2) The cost and expense payable to any such third-party reviewer shall be borne by:

(a) If such review demonstrates compliance with the requirements of this Section 16.4, the MBTA; and

(b) If such review indicates any material failure of compliance with the requirements of this Section 16.4, the Systems Integrator.

Each Party shall have the right to have representatives present for any inspection conducted pursuant to this Section 16.4, and the Systems Integrator shall promptly remedy any failure of compliance determined by any such inspection.

(G) Access and Use by the MBTA Prior to Release. The Requisite Deposit Materials shall be held by the Escrow Agent in escrow in accordance with the Escrow Agreement and, in addition to the MBTA's rights pursuant to Section 16.4(H), the MBTA shall be entitled to access and use such materials during any time when the MBTA is exercising its step-in rights pursuant to Article 21 21 (Remedies of the Parties and MBTA Step-In Rights).

(H) Release and Delivery to the MBTA. Without limiting Section 16.4(G), the Requisite Deposit Materials shall be released and delivered to the MBTA for its use upon the occurrence of one or more of the following events:

(1) The Systems Integrator makes a general assignment for the benefit of creditors, files a voluntary petition in bankruptcy or petitions for reorganization or arrangement under the bankruptcy laws;

(2) A petition in bankruptcy is filed against the Systems Integrator or a receiver is appointed for all or any part of the property and assets of the Systems Integrator;

(3) A termination of this Project Agreement due to a Systems Integrator Event of Default;

(4) The material breach by the Systems Integrator of this Section 16.4 or of the Escrow Agreement, and such material breach remains uncured for a period of 30 days following such material breach; or

(5) Any early termination or expiration of the Escrow Agreement; provided, however that this event shall be curable by the Systems Integrator if, within 30 days of the early termination or expiration of the Escrow Agreement, the Systems Integrator either renews or reinstates the Escrow Agreement or the Parties enter into a new Escrow Agreement that complies with the all of the requirements set out herein.

(I) Release of Source Code by Mutual Agreement. In addition to the mechanisms allowing the release of the Source Code in Sections 16(G) and 16(H), the Parties agree that that the Source Code may be released by mutual agreement. The Parties agree to negotiate the release of the Source Code in good faith, taking into consideration the Systems Integrator's business needs and the MBTA's use for such Source Code.

(J) Restrictions on MBTA Use of Requisite Deposit Materials. The MBTA's right to use the Requisite Deposit Materials under Section 16.4(G) and Section 16.4(H) shall be subject to the terms and conditions of the licenses granted to the MBTA pursuant to this Article 16. By way of clarifying example, the MBTA's right to use the Requisite Deposit Materials includes the right to use Front-End System Elements as contemplated herein.

(K) Applicability Only to Requisite Deposit Materials. The Systems Integrator acknowledges and agrees that the foregoing provisions of this Section 16.4 shall be applicable only to the Requisite Deposit Materials and that, without limiting the obligation of the MBTA to comply with the terms and conditions of the licenses granted to the MBTA under Section 16.2, all other Proprietary Intellectual Property shall be delivered directly to the MBTA for its use as and when required by the terms of this Project Agreement. Without limiting anything in the preceding sentence, the Systems Integrator shall deliver directly to the MBTA all System APIs (including all API Source Code) and Open Source Software:

(1) At least 30 days prior to the implementation of any applicable API Source Code into the System;

(2) Within 15 days following any change to such Source Code; and

(3) At any other time required by any provision of this Project Agreement or otherwise requested by the MBTA.

(L) Term of Escrow Agreement. The Parties agree that the term of the Escrow Agreement shall commence on its effective date and shall continue in effect until 15 calendar years following the Termination Date.

SECTION 16.5.MBTA INTELLECTUAL PROPERTY, OWNERSHIP AND GRANT OF RIGHTS.

(A) MBTA Ownership. Notwithstanding anything to the contrary set forth in this Project Agreement, as between the MBTA and any Systems Integrator Person, the MBTA owns all right, title and interest in and to: (i) the Data and all associated Intellectual Property, including all logs, reports, metrics, records and other data; (ii) the MBTA Fare Gate Interface Controller Board, the associated MBTA Interface Control Documentation, and all associated Intellectual Property; (iii) MBTA

Confidential Information and all associated Intellectual Property; (iv) all inputs that embody MBTA Intellectual Property Rights and that the MBTA might contribute or provide the Systems Integrator access to under this Project Agreement; and (v) all other Intellectual Property owned or controlled by the MBTA (collectively, the “**MBTA IPR**”). The term MBTA IPR expressly excludes Existing System components (including Eligible Existing System Components). The Systems Integrator shall provide copies of all MBTA Interface Control Documentation to the MBTA immediately upon demand.

(B) Grant of Rights to Systems Integrator in MBTA-Related Assets and IPR; Eligible Existing System Components. The MBTA, under its Intellectual Property rights, hereby grants to the Systems Integrator during the Term, a non-exclusive, limited, non-sublicensable, non-transferable license to use the MBTA IPR and the Eligible Existing System Components solely for the purpose of the Systems Integrator fulfilling its obligations under this Project Agreement in accordance with the Contract Standards and otherwise subject to all terms and conditions of this Project Agreement. The Systems Integrator acknowledges and agrees that the MBTA’s grant of right to the Systems Integrator pursuant to this Project Agreement is limited to the extent of the MBTA’s underlying Intellectual Property rights. The MBTA reserves the right to require, as condition precedent to receipt of relevant information in respect of the Eligible Existing System Components, to require any Systems Integrator Person to enter into a non-disclosure agreement that is substantially similar to the MBTA Standard Non-Disclosure Agreement in all material respects to protect the confidentiality and proprietary nature of the Eligible Existing System Components.

(C) MBTA Trademarks. Notwithstanding anything to the contrary set forth in this Project Agreement, as between the MBTA and any Systems Integrator Person, the MBTA owns all right, title and interest in and to the MBTA Trademarks and all associated Intellectual Property, including any trademark or service mark used or adopted as the trade name of the System or any System Element. The MBTA, under its Intellectual Property Rights, hereby grants to the Systems Integrator during the Term, a limited, non-exclusive, non-transferable, royalty-free license to use the MBTA Trademarks solely for the purpose of fulfilling its obligations under this Project Agreement and further subject to the following:

- (1) The MBTA shall have sole authority over the use of any MBTA Trademark;
- (2) No MBTA Trademark may be used by any Systems Integrator Person without the MBTA’s prior written consent delivered after the Effective Date;
- (3) Any such consent may be revoked by the MBTA by giving the Systems Integrator written notice thereof, which revocation shall be effective on the date specified by the MBTA (acting reasonably) in such notice;
- (4) All Systems Integrator Persons authorized to use any MBTA Trademark pursuant to this Section 16.5 shall follow all trademark use guidelines communicated by the MBTA to the Systems Integrator and use such MBTA Trademarks only in a manner that is of sufficient quality and promotes the good name and reputation of the MBTA; and
- (5) All use of the MBTA Trademarks and all goodwill associated therewith shall inure to the MBTA’s benefit.

SECTION 16.6. INTELLECTUAL PROPERTY INDEMNIFICATION.

(A) Applicability to Claims Relating to Intellectual Property Rights. The Systems Integrator acknowledges and agrees that its indemnification obligations under Section 18.1 include the

obligation to release, indemnify, defend and hold harmless the Indemnified Parties on demand from and against all Loss that any Indemnified Party may sustain in connection with:

- (1) Any claim or cause of action against any Indemnified Party by any third party, including any Systems Integrator Person other than the Systems Integrator, arising out of or relating to any allegation that the System, any System Element or any exercise by the MBTA of its rights in accordance with this Article 16 infringes, misappropriates or violates any Intellectual Property right of any person (each a “**Third Party IP Claim**”); and
- (2) Enforcing its rights under Section 18.1 or this Section 16.6.

It is agreed and understood, however, that the Systems Integrator shall not be obligated to indemnify, defend, or hold harmless the Indemnified Parties to the extent the Third Party IP Claim arises out of (i) modifications to the System or System Elements by the MBTA (or on its behalf) that are not authorized by the Systems Integrator or by applicable Documentation, or (ii) the MBTA’s use of the System or System Elements in a manner not contemplated in the Project Agreement.

(B) Systems Integrator Response. Without limiting any obligation of the Systems Integrator under Article 18 or otherwise hereunder and without prejudice to any right of any Indemnified Party, in the event of any claim or cause of action described in Section 16.6(A), the Systems Integrator shall promptly, at its option and sole cost and expense, either:

- (1) Acquire for the MBTA all rights necessary for the System to continue to operate and be used in accordance with this Project Agreement, including all rights necessary to provide the MBTA with all license and related rights under this Article 16;
- (2) Make and deliver such alterations, modifications or adjustments to the System so that no System Element infringes on any Intellectual Property right of any person and all System Elements remain in compliance with the Contract Standards; or
- (3) Replace each applicable System Element with a replacement System Element meeting all requirements of the Contract Standards so that no System Element infringes on any Intellectual Property right of any other person.

(C) Limited MBTA Indemnification. The MBTA shall, to the extent permitted by Applicable Law, release, indemnify, defend and hold harmless the Systems Integrator from and against all amounts that the Systems Integrator may sustain in connection with any claim or cause of action against the Systems Integrator, arising out of or relating to any allegation that an Eligible Existing System Component infringes, misappropriates, or violates any Intellectual Property right of a Third Party (each, a “**Covered Systems Integrator Claim**”). The MBTA’s indemnification obligation under this Section 16.6(C) is conditioned upon the Systems Integrator: (i) giving the MBTA reasonable written notice of any Covered Systems Integrator Claim for which the Systems Integrator is seeking indemnification; (ii) granting sole control of the defense and settlement of the Covered Systems Integrator Claim to the MBTA; and (iii) providing all cooperation requested by the MBTA, at the MBTA’s sole expense. The Systems Integrator acknowledges and agrees to the following:

- (1) In order to mitigate potential harm, the Systems Integrator shall, at the direction of the MBTA, immediately cease its use of any Eligible Existing System Component should the MBTA determine that such Eligible Existing System Component is or is likely to infringe an Intellectual Property right of a Third Party; and

(2) The MBTA shall have no indemnification obligation to the Systems Integrator under this Section 16.6(C) if the Covered Systems Integrator Claim results from the Systems Integrator either (i) exceeding, breaching, or otherwise violating the rights granted to it pursuant to Section 16.5(B), or (ii) breaching any of its applicable confidentiality obligations under this Project Agreement.

SECTION 16.7. PERPETUAL GRANT OF RIGHTS TO THE MBTA.

(A) Rights in Front-End System Elements; SI System Elements. Under its and their Intellectual Property Rights, the Systems Integrator hereby grants, and shall cause Project Contractors and Subcontractors to grant, to the MBTA a perpetual, irrevocable, non-exclusive, fully paid-up, royalty-free, sublicensable license, during and after the Term, to install, copy, modify, display, distribute, perform, access, execute and otherwise use all SI System Elements that constitute or are associated with Front-End System Elements for all MBTA Activities. By way of example and not limitation, the MBTA's rights under this Section 16.7(A) include the right to replace components of Front-End System Elements, including components that consist of PCBs.

(B) Rights in Front-End System Elements; Third Party System Elements. Notwithstanding anything to the contrary, the Systems Integrator shall either (i) obtain for the MBTA a perpetual, irrevocable, non-exclusive, fully paid-up, royalty-free, sublicensable license, during and after the Term, for the MBTA to install, copy, modify, display, distribute, perform, access, execute and otherwise use all Third Party System Elements that constitute or are associated with Front-End System Elements for all MBTA Activities, or (ii) ensure that such Third Party System Elements that constitute or are associated with Front-End System Elements are commercially available to the MBTA upon the Termination Date.

(C) Rights in Standard Work Product. Without limiting the Systems Integrator's obligations under Section 16.7(A), and by way of example, under its and their Intellectual Property Rights, the Systems Integrator hereby grants, and shall cause Project Contractors and Subcontractors to grant, to the MBTA a perpetual, irrevocable, non-exclusive, fully paid-up, royalty-free, sublicensable license, during and after the Term, to install, copy, modify, display, distribute, perform, access, execute and otherwise use all Standard Work Product for all MBTA Activities.

(D) Rights in System APIs. Under its and their Intellectual Property Rights, the Systems Integrator hereby grants, and shall cause Project Contractors and Subcontractors to grant, to the MBTA a perpetual, irrevocable, non-exclusive, fully paid-up, royalty-free, sublicensable license, during and after the Term, to install, copy, modify, display, distribute, perform, access, execute and otherwise use all System APIs (including Reader APIs) for all MBTA Activities. By way of example and not limitation, (i) the MBTA's rights under this Section 16.7(D) include the right to provide the same to Third Parties in connection with all MBTA Activities, and (ii) the Systems Integrator's grant of rights extend to all System APIs used in the System, including API Source Code developed by Third Parties or that otherwise constitute Third Party System Elements.

(E) Rights in Back-End System Elements. Under its and their Intellectual Property Rights, the Systems Integrator hereby grants, and shall cause Project Contractors and Subcontractors to grant, to the MBTA a perpetual, irrevocable, non-exclusive, fully paid-up, royalty-free, sublicensable license, during and after the Term, to install, copy, modify, display, distribute, perform, access, execute and otherwise use all Back-End System Elements (including those Back-End System Elements that are comprised of Third Party System Elements) for all MBTA Activities. The MBTA acknowledges that, unless Source Code for Back-End System Elements is released or made available to the MBTA for use pursuant to Section 16.4, the grant of rights set out in this Section 16.7(E) does not apply to the applicable

Source Code. The Systems Integrator shall ensure that such Third Party System Elements that constitute or are associated with Back-End System Elements are otherwise commercially available to the MBTA upon the Termination Date.

(F) Perpetual Grant of Rights in Documentation. Under its and their Intellectual Property Rights, the Systems Integrator hereby grants, and shall cause Project Contractors and Subcontractors to grant, to the MBTA a perpetual, irrevocable, non-exclusive, fully paid-up, royalty-free, sublicensable license, during and after the Term, to install, copy, modify, display, distribute, perform, access, execute and otherwise use all System Documentation (to the extent such System Documentation embodies Intellectual Property Rights of the Systems Integrator, Project Contractors, or Subcontractors) for all MBTA Activities. If the MBTA sublicenses to a third party any of the rights granted pursuant to this Section 16.7(F) and such Documentation contains Proprietary Work Product, then the third party shall be required to enter into a non-disclosure agreement that is substantially similar to the MBTA Standard Non-Disclosure Agreement in all material respects.

(G) Perpetual Rights in Fare Card Materials, and Encryption and Access Keys. Under its and their Intellectual Property Rights, the Systems Integrator hereby grants, and shall cause Project Contractors and Subcontractors to grant, to the MBTA a perpetual, irrevocable, non-exclusive, fully paid-up, royalty-free, sublicensable license, during and after the Term:

- (1) To read any unencrypted Credential serial number from any Fare Card and use that serial number for any purpose;
- (2) To encode and manufacture Fare Cards;
- (3) To access restricted password-protected portions of the System, and to obtain encryptions keys, access control credentials, and other needed permissions during any time when the MBTA is exercising its step-in rights pursuant to Article 21 (Remedies of the Parties and MBTA Step-In Rights); and
- (4) To otherwise use the Fare Cards in connection with MBTA Activities including, those activities set out in Section 1 of Appendix 2.6.

SECTION 16.8. TRANSFER OF OWNERSHIP AND PERPETUAL GRANT OF RIGHTS WITH RESPECT TO SYSTEM WEBSITE.

(A) Ownership Transfer. The Systems Integrator hereby transfers, and shall cause Project Contractors and Subcontractors to transfer, all of its and their right, title, and interest in and to all elements of the System Website that constitute Proprietary Work Product, including its and their rights in associated Intellectual Property. By way of example, and not limitation, this transfer includes all rights in any domain name associated with the System Website.

(B) Perpetual Grant of Rights. Under its and their Intellectual Property Rights, the Systems Integrator hereby grants, and shall cause Project Contractors and Subcontractors to grant, to the MBTA a perpetual, irrevocable, non-exclusive, fully paid-up, royalty-free, sublicensable license, during and after the Term, to install, copy, modify, display, distribute, perform, access, execute and otherwise use all System Elements of the System Website, including all tag lines, logos, color schemes, fonts, graphics, banners, buttons and other graphical elements used on the System Website (to the extent such System Elements embody Intellectual Property Rights of the Systems Integrator, Project Contractors, or Subcontractors) for all MBTA Activities.

SECTION 16.9. RIGHTS IN KEY ASSETS RELATING TO MBTA STEP-IN ACTION AND HANDBACK REQUIREMENTS.

Without limiting the Systems Integrator’s obligations under this Article 16, and by way of example, under its and their Intellectual Property Rights, the Systems Integrator hereby grants, and shall cause Project Contractors and Subcontractors to grant, to the MBTA a non-exclusive, fully paid-up, royalty-free, sublicensable license to install, copy, modify, display, distribute, perform, access, execute and otherwise use all SI System Elements for all MBTA Activities during any Step-In Period.

SECTION 16.10. RIGHTS FROM PROJECT CONTRACTORS AND SUBCONTRACTORS.

(A) Obligation to Obtain Requisite Rights and IPR Protections. Without limiting the Systems Integrator’s obligations with respect to the Intellectual Property Rights of Project Contractors and Subcontractors, and by way of example, the Systems Integrator shall cause Project Contractors and Subcontractors (a) to grant to the Systems Integrator and to the MBTA all rights set out in this Article 16, and all rights necessary or advisable for the Systems Integrator to fulfill its obligations under the Project Agreement; and (b) to provide representations, warranties, and indemnities concerning their own Intellectual Property and any relevant Third Party Intellectual Property that are at least as favorable as those set out in favor of the MBTA under this Project Agreement.

(B) Clarifying Examples. Without limiting the generality of Section 16.10(A), the Systems Integrator shall, without limiting any other obligation hereunder:

(1) Obtain from Systems Integrator Persons all rights and licenses to such Intellectual Property that are necessary to enable the Systems Integrator to install, operate, maintain, repair and manage the System as now or hereafter constituted and to perform the Contract Services; and

(2) To the extent such Intellectual Property is embodied in System Elements that constitute part of the Requisite Deposit Materials, obtain the written consent of such Systems Integrator Person to have such System Elements deposited in the Software Escrow in accordance with Section 16.4; in each case,

Concurrently with the execution of any contract, subcontract or purchase order with such person or with the first use or adaptation of such Proprietary Intellectual Property in connection with the Project.

SECTION 16.11. SUBLICENSING RIGHTS.

For the avoidance of doubt, the Systems Integrator acknowledges and agrees (and shall cause any other Systems Integrator Person to so acknowledge and agree) that the MBTA is entitled to sublicense its rights under this Article 16 to the DB Entity, concessionaires, contractors, subcontractors, employees, consultants, and other persons or entities (including other Third Parties) that are retained by or on behalf of the MBTA in connection this Project Agreement and the MBTA’s rights hereunder (and the Project generally), including for all MBTA Activities related to the System; provided, however, that any such sublicensees (excluding all individuals except for those that are working as independent contractors) shall be required to enter into a non-disclosure agreement that is substantially similar to the MBTA Standard Non-Disclosure Agreement in all material respects, if requested by the Systems Integrator, to protect any confidential information that may be disclosed in connection with the MBTA’s exercising of its rights pursuant to this Section 16.11. However, the granting of any such license and the MBTA’s

rights thereunder shall not be construed to provide the MBTA with greater rights to oversee, direct, manage and engage in the Project than the MBTA otherwise has under this Project Agreement.

SECTION 16.12. ADDITIONAL MBTA RIGHTS.

In addition to the other rights set out in this Article 16, the Systems Integrator hereby agrees as follows:

(A) Interoperability. During and after the Term, the MBTA shall have the right to use and modify SI System Elements for purposes of ensuring (i) interoperability among any and all System Elements; (ii) interoperability among any and all System Elements and other MBTA-supplied systems or components (now known or hereafter developed); and (iii) interoperability among any and all System Elements and Third Party systems and components (now known or hereafter invented).

(B) Continuation of Rights. The MBTA's ownership rights and rights under perpetual licenses granted under this Article 16 shall continue and survive regardless of whether (i) the MBTA is in breach of its obligations under the Project Agreement; (ii) the Project Agreement has been terminated by either Party for any reason; or (iii) the Project Agreement has expired.

SECTION 16.13. CERTAIN RESTRICTIONS ON MBTA RIGHTS.

(A) Exercise of License Rights. Without limiting any right of transfer pursuant to Section 16.13(B), the MBTA shall be entitled to exercise its rights under any license granted under this Article 16 solely for the benefit of the MBTA and the Users as contemplated by this Project Agreement.

(B) Transfer Restrictions. The MBTA's right to transfer a license under this Article 16 shall be limited to any Governmental Body that succeeds to the MBTA's interests in all or any portion of the Project, or to the power and authority of the MBTA generally or with respect to all or any portion of the Project. Each license under this Article 16 shall be divisible in the event of a transfer in accordance with this Section 16.13(B) of or with respect to a portion of the Project. Nothing in this Section 16.13(B) shall be construed to limit the MBTA's sublicensing rights under any license, as described in Section 16.11.

SECTION 16.14. EXTENSION OF RIGHTS TO REGIONAL TRANSIT PROVIDERS.

The Systems Integrator hereby commits, and shall cause Project Contractors and Subcontractors, as applicable, to commit to grant to Regional Transit Providers Intellectual Property Rights equivalent in all material respects to those set out in this Article 16 in connection with contracts specified in Section 12.3(A) to the extent that there is an RTP Contract in place.

SECTION 16.15. USE AS CLEARINGHOUSE.

The term "**Clearinghouse Services**" shall mean the collection, receipt, processing, exchange, and dissemination of information, and related services, all as required in accordance with the Technical Requirements, but solely with respect to the MBTA's use with RTPs and for Integrated Services. For the avoidance of doubt, the Systems Integrator hereby agrees (and shall cause Project Contractors and Subcontractors similarly to agree) that the MBTA shall be entitled, during and after the Term, to use the System to provide Clearinghouse Services to interested parties with respect to transportation and related subject matter areas, including with respect to transportation services offered by the MBTA and other transportation services providers.

SECTION 16.16. ORDER OF PRECEDENCE.

To the extent there is a conflict between (a) the terms set out in this Article 16 (Intellectual Property Rights) and (b) any other terms set out in the Project Agreement, the terms set out in this Article 16 shall control.

SECTION 16.17. PRELIMINARY INJUNCTIVE RELIEF.

The Systems Integrator acknowledges and agrees that a breach of its obligations under this Article 16 shall be deemed conclusively to cause irreparable harm to the MBTA in all instances, and that the MBTA shall accordingly be entitled to preliminary injunctive relief without the need to demonstrate irreparable harm in connection with a breach or threatened breach by the Systems Integrator (or a Project Contractor or Subcontractor) of this Article 16. The MBTA shall not be required to post a bond or provide other security in connection with an award of such preliminary injunctive relief.

SECTION 16.18. RIGHTS UNDER BANKRUPTCY CODE SECTION 365(n).

The licenses granted to the MBTA under this Article 16 are rights to "intellectual property" for purposes of Section 365(n) of the U.S. Bankruptcy Code, and the MBTA shall be entitled to exercise all rights provided by such Section 365(n). The Systems Integrator hereby agrees, and shall cause Project Contractors and Subcontractors to agree, that they will not interfere with the MBTA's exercise of such rights, and further agrees that the MBTA shall maintain the licenses under the terms of this Project Agreement, even if the Systems Integrator or any Project Contractor or Subcontractor should cease operations or be purchased or merge into another entity.

SECTION 16.19. NO IMPLIED RIGHTS.

Nothing herein shall be construed so as to grant the Systems Integrator any rights other than those expressly provided in this Project Agreement. Any rights granted to the Systems Integrator must be expressly provided herein, and there shall be no implied rights pursuant to this Project Agreement, based on any course of conduct or other construction or interpretation thereof. The MBTA expressly reserves all rights and licenses not expressly granted to the Systems Integrator in this Project Agreement.

SECTION 16.20. SYSTEMS INTEGRATOR THIRD PARTY SYSTEM ELEMENTS OBLIGATIONS UPON TERMINATION DATE.

Notwithstanding anything to the contrary, upon any Termination Date the Systems Integrator shall: (i) immediately transfer to the MBTA all licenses that the Systems Integrator has in Third Party System Elements, or (ii) if the Systems Integrator is unable to transfer such licenses, then the SI shall, at its sole cost and expense, modify the System so that it uses Third Party System Elements that are commercially available to the MBTA. By way of clarification, and not limitation, if upon the termination or expiration of this Project Agreement, an existing Third Party System Element is not either commercially available to the MBTA or the Systems Integrator is unable to transfer such license to the MBTA (despite the required perpetual license grant to the MBTA in such Third Party System Element pursuant to Section 16.7(E)), then the Systems Integrator shall, at its sole cost and expense, replace such Third Party System Element with one that is commercially available, and integrate the same into the System.

ARTICLE 17

INSURANCE, DAMAGE AND DESTRUCTION

SECTION 17.1. INSURANCE GENERALLY.

(A) Required Insurance. At all times during the Term, the Systems Integrator shall, at a minimum, obtain, maintain and comply with, or cause to be obtained, maintained and complied with, the terms and conditions of the Required Insurance, including all requirements set forth in Appendix 12 (Insurance Requirements), and shall pay, or cause to be paid, all premiums with respect to each policy of Required Insurance as the same become due and payable.

(B) Project Contractors and Subcontractors. The Systems Integrator shall ensure that all Project Contractors and Subcontractors secure and maintain all insurance coverage and other financial sureties required by Appendix 12 (Insurance Requirements) and by Applicable Law in connection with their presence and the performance of their duties at or concerning the Project.

(C) Inadequacy of Required Insurance. The MBTA makes no representation that the scope of coverage and limits of liability specified for any Required Insurance or any approved variances therefrom are adequate to protect the Systems Integrator against its undertakings under this Project Agreement to the MBTA, or its liabilities to any third party. It is the responsibility of the Systems Integrator and each Project Contractor and Subcontractor to determine if any additional coverages are required to adequately protect their interests. No such limits of liability or approved variances shall preclude the MBTA from taking any actions as are available to it under this Project Agreement or Applicable Law.

(D) Compliance with Insurer Requirements. The Systems Integrator shall comply promptly with the requirements of all insurers pertaining to the Project under any policy of Required Insurance. The Systems Integrator shall not do or permit anything to be done that results in the cancellation or the reduction of coverage under any policy of Required Insurance and shall use all reasonable efforts to prevent the cancellation or the reduction of coverage under any policy of Required Insurance.

(E) Failure to Provide Insurance Coverage. If the Systems Integrator fails to pay any premium for Required Insurance, or if any insurer cancels any Required Insurance policy and the Systems Integrator fails to obtain replacement coverage so that the Required Insurance is maintained on a continuous basis, the MBTA shall have the right, but not the obligation, to pay such premium or procure similar insurance coverage from another insurer and, upon any such payment by the MBTA, the amount thereof shall be immediately reimbursable to the MBTA by the Systems Integrator. The failure of the Systems Integrator to obtain and maintain any Required Insurance shall not relieve the Systems Integrator of its liability for any losses intended to be insured thereby.

(F) Reductions for Insurance Proceeds and Insurance Receivables. The Systems Integrator shall not be entitled to any payment or credit (or any portion of either thereof) which would have been due, or from which it would have otherwise received a benefit, from the MBTA under this Project Agreement to the extent that the Systems Integrator is or should be able to recover the amount or receive the benefit of such payment or credit (or any portion of either thereof) under the following (together, the “**Available Insurance**”):

(1) Any policy of Required Insurance (whether or not such policy is in fact effective or, if initially made effective, has been vitiated, cancelled or declared void as a result of any act or

omission of any Systems Integrator Person), but excluding any insurance coverage that is unavailable in respect of any Uninsurable Risk or Unavailable Insurance Condition or as the result of the breach of this Project Agreement by the MBTA or violation of Applicable Law by the MBTA;

(2) Any other policy of insurance that the Systems Integrator has obtained and maintains; or

(3) Any other policy of insurance that the Systems Integrator is entitled to claim under as an additional insured; provided that,

In respect of the insurances described in Items (2) and (3), above, unless the Systems Integrator fails to meet its obligations under Section 17.2, only to the extent the Systems Integrator is actually able to recover amounts under the applicable policy.

(G) Relationship to Liability and Indemnity. The compliance or failure of compliance by any Systems Integrator Person with the requirements hereunder in respect of the Required Insurance shall not be construed to be a satisfaction of any Systems Integrator liability under this Project Agreement or in any way limit, modify or satisfy the Systems Integrator's indemnity obligations hereunder.

SECTION 17.2. NOTICE AND PROSECUTION OF INSURANCE CLAIMS.

(A) Reporting and Processing Claims. The MBTA shall have the right, but not the obligation, to report directly to the insurers and process the MBTA's claims against applicable policies of Required Insurance. Unless otherwise directed by the MBTA in writing with respect to the MBTA's insurance claims, the Systems Integrator shall:

(1) Be responsible for reporting and processing all potential claims by the MBTA or the Systems Integrator against the Required Insurance;

(2) Timely report to the insurers under each applicable policy of Required Insurance any and all matters which may give rise to an insurance claim by the Systems Integrator or, to the extent the Systems Integrator has knowledge of or has been provided notice of the same, the MBTA or another Indemnified Party;

(3) Promptly and diligently pursue such insurance claims in accordance with the claims procedures specified in such policies of Required Insurance;

(4) Enforce all legal rights against the insurer under the applicable policies of Required Insurance and Applicable Law in order to collect thereon, including pursuing necessary litigation and enforcement of judgments; provided, that the Systems Integrator shall be deemed to have satisfied its obligation under this Item (4) if a judgment is not collectible through the exercise of lawful and diligent means.

(B) Systems Integrator Notice and Consultation. The Systems Integrator shall:

(1) Promptly notify the MBTA, and thereafter keep the MBTA fully informed, of any incident, potential claim, claim or other matter of which the Systems Integrator becomes aware that involves or could conceivably involve an Indemnified Party as a defendant or a claim that is being denied by an insurer; and

(2) Regularly consult with the MBTA and provide any additional information reasonably requested by the MBTA concerning any of the foregoing.

(C) MBTA Notice. The MBTA agrees to promptly notify the Systems Integrator of potential claims against the MBTA and matters which are reasonably expected to give rise to an insurance claim (to the extent the MBTA is aware of such potential claims and matters), and to tender to the insurer the MBTA's defense of the claim under such policies of Required Insurance. The MBTA shall cooperate with the Systems Integrator as reasonably necessary for the Systems Integrator to fulfill its duties hereunder, including by providing the Systems Integrator a copy of all written materials the MBTA receives asserting a claim against the MBTA that is subject to defense by an insurer under a policy of Required Insurance.

(D) Failure of Performance; Inability to Collect. If in any instance the Systems Integrator has not performed its obligations respecting insurance coverage set forth in this Project Agreement or is unable to enforce and collect any such insurance for failure to assert claims in accordance with the terms of the policies of Required Insurance or to prosecute claims diligently, then, for purposes of determining the Systems Integrator's liability and the limits thereon or determining reductions in compensation due from the MBTA to the Systems Integrator on account of available insurance, the Systems Integrator shall be treated as if it has elected to self-insure up to the full amount of insurance coverage which would have been available had the Systems Integrator performed such obligations and not committed such failure. Nothing in this Section shall be construed to limit, modify or satisfy the Systems Integrator's indemnity obligations hereunder.

SECTION 17.3. LOSS, DAMAGE OR DESTRUCTION.

(A) Protection. The Systems Integrator shall use care and diligence, and shall take all reasonable and appropriate precautions in accordance with the Contract Standards, to protect the Project from loss, damage or destruction. The Systems Integrator shall report to the MBTA and the insurers, immediately upon obtaining knowledge thereof, any damage or destruction to the Project and as soon as practicable thereafter shall submit a full report to the MBTA. The Systems Integrator shall also submit to the MBTA, within 24 hours of receipt, copies of all accident and other reports filed with, or given to the Systems Integrator by, any insurer, adjuster or Governmental Body.

(B) Repair of Property. Without limiting any other requirement herein, the Systems Integrator shall promptly repair or replace all property owned by any MBTA Person or any other public or private owner that is damaged by the Systems Integrator or any other Systems Integrator Person in connection with the performance of, or the failure to perform, the Contract Services. The repair and replacements shall restore the damaged property, to the maximum extent reasonably practicable, to its character and condition existing immediately prior to the damage.

(C) Project Agreement Not Affected. Except as otherwise expressly provided herein, the partial destruction or damage or complete destruction of the Project by fire or other casualty will not permit either party to terminate this Project Agreement or entitle the Systems Integrator to demand any increase in any amounts payable to the Systems Integrator under this Project Agreement.

(D) Obligations Upon Damage or Destruction to Project. Subject to Section 17.4 and without prejudice to anything set forth in Article 13 (Supervening Events), if all or any part of the Project is damaged or destroyed, the Systems Integrator shall, in accordance with the Contract Standards, undertake all work necessary to repair, replace and restore the damaged or destroyed portions of the Project and related assets (the "**Reinstatement Work**"). The Systems Integrator's obligation to perform Reinstatement Work hereunder shall be further subject to:

- (1) The requirements of Applicable Law;
 - (2) As and to the extent required under Article 13 (Supervening Events) in respect of Compensation Events, the MBTA issuing a Change Order authorizing the performance of Reinstatement Work and payment to the Systems Integrator in:
 - (a) The amount, if any, by which the cost of such Reinstatement Work exceeds the proceeds of, or amount recoverable under, the Available Insurance; or
 - (b) If no insurance coverage is required under this Project Agreement in respect of the cause of such damage or destruction and to the extent the Available Insurance is inapplicable, an amount equal to the total costs of such Reinstatement Work; and
 - (3) To the extent such damage or destruction occurs after the Full Service Commencement Date as a direct result of a Relief Event (subject to Article 13 (Supervening Events)), the MBTA issuing a Change Order authorizing the performance of Reinstatement Work and payment to the Systems Integrator in:
 - (a) The amount, if any, by which the cost of such Reinstatement Work exceeds the proceeds of, or amount recoverable under, the Available Insurance; or
 - (b) If no insurance coverage is required under this Project Agreement in respect of the cause of such damage or destruction and to the extent the Available Insurance is inapplicable, an amount equal to the total costs of such Reinstatement Work.
- (E) Application of Physical Damage Proceeds. Subject to Section 17.4, all insurance proceeds received or receivable under any policy of Required Insurance in respect of physical damage to the Project (excluding any delay in startup or business interruption insurance maintained as part of such policies, “**Physical Damage Proceeds**”), shall be first applied to repair, replace and restore each part or parts of the Project in respect of which such proceeds were received.

SECTION 17.4. REINSTATEMENT WORK.

(A) Draft Reinstatement Plan. If the Project suffers damage or destruction that is likely to cost more than \$1,000,000, Index Linked, to repair, replace and restore, the Systems Integrator shall promptly, and in any event within 30 days of such damage or destruction and before undertaking any material remedial work (other than any emergency work required to comply with Applicable Law or to address a material risk to the health or safety of any person), provide the MBTA with a draft plan (the “**Draft Reinstatement Plan**”) for the carrying out of Reinstatement Work, which plan shall contain to the extent possible the details required to be included in the Reinstatement Plan under subsection (C) of this Section.

(B) Reinstatement Plan. As soon as reasonably practicable and in any event within 15 Business Days after the delivery of the Draft Reinstatement Plan, the MBTA shall provide the Systems Integrator with any comments it may have to the Draft Reinstatement Plan. As soon as reasonably practicable and in any event within 15 Business Days after receipt of the MBTA’s comments, the Systems Integrator shall deliver to the MBTA a revised plan (upon acceptance by the MBTA in accordance with subsection (D) of this Section, the “**Reinstatement Plan**”) to reasonably take into account the comments received from the MBTA and making changes to the Draft Reinstatement Plan necessary to reflect the contractual terms agreed (as negotiated and finalized) with the person effecting the Reinstatement Work.

(C) Reinstatement Plan Details. The Reinstatement Plan shall set forth in as much detail as is reasonable in the circumstances:

- (1) The identity of the person or persons intended to effect the Reinstatement Work;
- (2) The terms and timetable or (if not then established) the reasonably anticipated terms and timetable upon which the Reinstatement Work are to be effected (including the date upon which the Project is reasonably expected to become fully operational again and the Operating Services to be fully provided);
- (3) The total cost or (if not then established) the reasonably anticipated total cost of the Reinstatement Work; and
- (4) The impact of any Change requested by the MBTA as part of the Reinstatement Work.

(D) Acceptance of Reinstatement Plan and Performance of Reinstatement Work. Following the MBTA's written acceptance of the Reinstatement Plan, which acceptance shall not be unreasonably withheld or delayed, the Systems Integrator shall, subject to Section 17.3(D), promptly perform the Reinstatement Work in accordance with the Reinstatement Plan. Any Reinstatement Plan shall require the Systems Integrator to perform Reinstatement Work in accordance with the Contract Standards, subject to any agreement made between the MBTA and the Systems Integrator in respect of the performance of the Reinstatement Work. Except as otherwise agreed to by the MBTA in its discretion, the MBTA shall have the same rights with respect to the monitoring and accepting of Reinstatement Work, including all review, comment and approval rights, as it has hereunder with respect to the performance of the Implementation Work.

(E) Physical Damage Proceeds. If Reinstatement Work is likely to cost more than \$1,000,000, Index Linked, all Physical Damage Proceeds received or receivable in respect of Reinstatement Work shall be paid to the MBTA to be held as a sub-account within its general accounts for purposes of payment for Reinstatement Work in accordance with subsection (F) of this Section (the "**Physical Damage Proceeds Reserve**"). During the Term, the MBTA shall only withdraw monies from the Physical Damage Proceeds Reserve in accordance with subsection (F) of this Section. The Systems Integrator shall have no interest in the Physical Damage Proceeds Reserve other than its contractual right to reimbursement in accordance with subsection (F) of this Section.

(F) Payment for Reinstatement Work. Subject to any Change Order issued by the MBTA in connection with any Reinstatement Work, the MBTA shall pay the Systems Integrator for the performance of Reinstatement Work to the extent that:

- (1) The Reinstatement Work complies with the Reinstatement Plan;
- (2) The Systems Integrator has provided all substantiation of costs required for payment; and
- (3) Monies paid into the Physical Damage Proceeds Reserve for the purpose of such Reinstatement Work are available for payment or, with respect to any amount described in Sections 17.3(D)(2) or 17.3(D)(3), the MBTA is obligated to make payment hereunder and has issued a Change Order in respect thereof.

Except as provided in this Section 17.4(F), the Systems Integrator shall be responsible for all cost and expense incurred in connection with the performance of Reinstatement Work, without any reimbursement or other payment obligation of the MBTA in respect thereof.

(G) Disposition of Physical Damage Proceeds. If the Expiration Date or Termination Date occurs prior to the completion of any Reinstatement Work:

(1) The Systems Integrator shall pay, or arrange for payment of, all remaining Physical Damage Proceeds to the MBTA, excluding those held in the Physical Damage Proceeds Reserve; and

(2) The MBTA shall be entitled to retain any amounts then standing to the credit of the Physical Damage Proceeds Reserve, subject to any continuing right of the Systems Integrator to payment under subsection (F) of this Section for Reinstatement Work performed prior to such date.

SECTION 17.5. UNINSURABLE RISKS.

(A) Notice. If a risk usually covered by any policy of Required Insurance becomes or is likely to become an Uninsurable Risk, then the Systems Integrator shall notify the MBTA promptly and in any event within the earlier of 10 Business Days:

(1) Following the Systems Integrator becoming aware that the risk is or is likely to become an Uninsurable Risk; and

(2) Before the expiration or cancellation of any existing insurance in respect of that risk (in each case irrespective of the reason for the same).

The Systems Integrator shall thereafter provide the MBTA with such information as the MBTA reasonably requests regarding the Uninsurable Risk.

(B) Determination of Uninsurable Risk. If both Parties agree, or it is determined pursuant to the Dispute Resolution Procedures, that a risk is an Uninsurable Risk, the MBTA and the Systems Integrator shall consider in good faith alternative insurance packages and programs that provide comparable coverage as is possible under then-existing insurance market conditions and other means by which the risk should be managed or shared (including considering the issue of self-insurance by either Party).

(C) Consequences of Uninsurable Risk. If both Parties agree, or it is determined pursuant to the Dispute Resolution Procedures, that a risk is an Uninsurable Risk and the Parties are unable to agree as to how to manage or share the relevant Uninsurable Risk within 30 days following the MBTA's receipt of notice from the Systems Integrator under subsection (A) of this Section, then the MBTA shall, in its discretion, either:

(1) Exercise its right to terminate this Project Agreement and pay the applicable Termination Amount in accordance with Section 24.7; or

(2) Elect to continue this Project Agreement in accordance with subsection (D) of this Section.

(D) Continuation of Project Agreement. If the MBTA elects to continue this Project Agreement in accordance with Section 17.5(C)(2), then for so long as the relevant risk remains an Uninsurable Risk:

(1) The MBTA shall retain its right to terminate this Project Agreement and pay the applicable Termination Amount in accordance with Section 24.7 and subject to Section 17.5(F);

(2) The Systems Integrator shall be relieved of its obligation hereunder to maintain the Required Insurance in respect of the Uninsurable Risk for so long as the risk remains an Uninsurable Risk (and for such time as is required for the Systems Integrator to obtain applicable insurance in accordance with subsection (E) of this Section);

(3) If the Uninsurable Risk occurs, without limiting anything under Section 17.5(F), the MBTA shall pay the Systems Integrator (in accordance with any applicable terms and conditions of this Project Agreement concerning the payment of insurance proceeds) an amount equal to the insurance proceeds that would have been payable had such risk not become an Uninsurable Risk, subject to the limitations, conditions and exclusions set out in the certificates and policies of insurance relating to such coverage most recently provided by the Systems Integrator to the MBTA (or, if no such certificates or policies of insurance have previously been provided, such limitations, conditions and exclusions as the MBTA may reasonably determine would have applied), and the Systems Integrator shall remain responsible for any deductibles; and

(4) In respect of each Month during any part of which the relevant insurance relating to such risk is not maintained, the Systems Integrator shall pay to the MBTA, or (at the MBTA's discretion during the Operating Period) the MBTA shall set off against the Monthly Payments, an amount equal to the premium that was payable by the Systems Integrator in respect of the relevant risk for the applicable Month immediately prior to the date on which the relevant risk became an Uninsurable Risk (using a reasonable estimate of such amount where a precise figure is not available, pro-rating any annual or other premium amount where appropriate and accounting for indexed inflation consistent with the terms of Appendix 8 (Payment Mechanism) from the date the relevant risk became an Uninsurable Risk).

(E) Obligations in Respect of Uninsurable Risks. For so long as any risk remains an Uninsurable Risk and this Project Agreement remains in effect, the Systems Integrator shall approach the insurance markets at least once every three Months to ascertain whether such risk remains an Uninsurable Risk. Promptly upon the Systems Integrator becoming aware that the risk is no longer an Uninsurable Risk, the Systems Integrator shall obtain and maintain, or cause to be obtained and maintained, the insurance required to be maintained for such risk pursuant to this Project Agreement, and upon such insurance becoming effective, the provisions of subsection (D) of this Section shall no longer apply in respect of such risk.

(F) Third Party Liability Insurance as an Uninsurable Risk. If this Project Agreement is terminated pursuant to Section 17.5(D)(1) in connection with the occurrence of an Uninsurable Risk and at the date of such termination third party liability is an Uninsurable Risk, and if:

(1) There is an outstanding third party claim against the Systems Integrator at the Termination Date; or

(2) Following the Termination Date, a third party claim is subsequently made against the Systems Integrator in respect of an event or circumstance that occurred prior to the Termination Date,

Which, in either case would have been covered by third party liability insurance that the Systems Integrator would have been required to carry had the risk not been an Uninsurable Risk, then the MBTA shall pay the Systems Integrator the amount for which the Systems Integrator becomes liable in respect of such claim in addition to the Termination Amount payable pursuant to Section 17.5(D)(1).

SECTION 17.6. UNAVAILABLE INSURANCE CONDITIONS.

(A) **Notice.** If any Insurance Condition that would otherwise be included in a policy of Required Insurance becomes, or is likely to become, an Unavailable Insurance Condition, then:

(1) The Systems Integrator shall notify the MBTA promptly, and in any event within 10 Business Days, after becoming aware of the existence of the Unavailable Insurance Condition or the likelihood of an Insurance Condition becoming an Unavailable Insurance Condition;

(2) The Systems Integrator shall thereafter provide the MBTA with such information as the MBTA may reasonably request regarding the Unavailable Insurance Condition; and

(3) The Parties shall meet promptly following notice from the Systems Integrator to discuss the possible Unavailable Insurance Condition and measures to address the circumstance.

(B) **Consequences of Unavailable Insurance Condition.** If both Parties agree, or it is determined pursuant to the Dispute Resolution Procedures, that an Insurance Condition has become an Unavailable Insurance Condition, then:

(1) The Systems Integrator shall be relieved of its obligation hereunder to include the relevant Insurance Condition in the relevant policy of Required Insurance for so long as the relevant Insurance Condition remains an Unavailable Insurance Condition (and for such time as is required for the Systems Integrator to obtain applicable insurance in accordance with subsection (C) of this Section); and

(2) In respect of each Month during any part of which the relevant Insurance Condition is an Unavailable Insurance Condition, the Systems Integrator shall pay to the MBTA, or (at the MBTA's discretion during the Operating Period) the MBTA shall set off against the Monthly Payments, an amount equal to the premium that was payable by the Systems Integrator in respect of the Unavailable Insurance Condition for the applicable month immediately prior to the date on which the relevant Insurance Condition became an Unavailable Insurance Condition (using a reasonable estimate of such amount where a precise figure is not available, pro-rating any annual or other premium amount where appropriate and accounting for indexed inflation consistent with the terms of Appendix 8 (Payment Mechanism) from the date the relevant Insurance Condition became an Unavailable Insurance Condition), net of any amount paid or payable by the Systems Integrator with respect to such Month to maintain, or cause to be maintained, any alternative or replacement term or condition in respect of such Unavailable Insurance Condition pursuant to subsection (D) of this Section.

(C) **Obligations in Respect of Unavailable Insurance Conditions.** For so long as any Insurance Condition remains an Unavailable Insurance Condition, the Systems Integrator shall approach the insurance markets at least once every three Months to ascertain whether such Insurance Condition remains an Unavailable Insurance Condition. Promptly upon the Systems Integrator becoming aware that the Insurance Condition is no longer an Unavailable Insurance Condition, the Systems Integrator shall obtain and maintain, or cause to be obtained and maintained, the relevant insurance containing such previously Unavailable Insurance Condition, and upon such insurance becoming effective, the provisions of subsection (B) of this Section shall no longer apply in respect of the Insurance Condition.

(D) Alternative Terms and Conditions. Notwithstanding subsection (B) of this Section, if both Parties agree, or it is determined pursuant to the Dispute Resolution Procedures, that an alternative to or replacement of any Unavailable Insurance Condition is available to the Systems Integrator in the worldwide insurance and reinsurance market with reputable insurers of good standing which, if included in the relevant insurance policy, would fully or partially address the Systems Integrator's inability to fully comply with its obligations in respect of the subject Insurance Condition, at a cost which contractors in North America with fixed price contracts are (at such time) generally prepared to pay, the Systems Integrator shall obtain and maintain, or cause to be obtained and maintained, insurance including such alternative or replacement term or condition.

SECTION 17.7. BENCHMARKING OF INSURANCE COSTS.

(A) Purpose. The procedures set forth in this Section 17.7 shall be used to determine whether the MBTA shall bear any increase, or benefit from any decrease, in the cost of Benchmarked Insurances.

(B) Joint Insurance Cost Report. The Insurance Broker shall prepare a report on behalf of both the Systems Integrator and the MBTA in relation to each Insurance Review Period (the "**Joint Insurance Cost Report**"). The Joint Insurance Cost Report is to be prepared at the Systems Integrator's sole cost and expense and shall, as a minimum, contain the following information for the relevant Insurance Review Period:

- (1) A full breakdown of the Actual Benchmarked Insurance Cost;
- (2) A full breakdown of the Base Benchmarked Insurance Cost;
- (3) A spreadsheet detailing separately:
 - (a) The sum(s) insured/limit(s) of indemnity (i.e. rateable factor) for each of the Benchmarked Insurances;
 - (b) The premium rate for each of the Benchmarked Insurances;
 - (c) The net premium paid (or to be paid) for each of the Benchmarked Insurances (i.e. excluding both insurance premium tax and broker's fees and commissions);
 - (d) The deductible(s) for each of the Benchmarked Insurances; and
 - (e) Details of all claims paid or reserved (including incident date, type and amount);
- (4) An assessment and quantification of each increase or decrease in insurance costs that, in the aggregate, determine the amount of any Project Insurance Change, together with reasons therefor;
- (5) The calculation of the Insurance Cost Differential and of any resulting Exceptional Cost or Exceptional Saving;
- (6) The opinion of the Insurance Broker as to the reasons why the Actual Benchmarked Insurance Cost has varied from the Base Benchmarked Insurance Cost, specifying

the impact of each of explanatory factor and quantifying the amount attributable to each such factor; and

(7) Evidence satisfactory to the MBTA (acting reasonably) of any changes to circumstances generally prevailing in the Relevant Insurance Markets that are claimed to account for the Insurance Cost Differential.

(C) MBTA Review. The Systems Integrator shall ensure that the Insurance Broker, no later than the date which is 10 Business Days after the end of the Insurance Review Period, delivers to the MBTA, at the same time as it delivers the same to the Systems Integrator, at least two copies of the Joint Insurance Cost Report. The MBTA, at its discretion, and at its sole cost and expense, may independently assess the accuracy of the information in the Joint Insurance Cost Report and retains the right to perform its own independent insurance review, which may include retaining advisors or performing its own assessment as to the impact of claims history on renewal costs. If the MBTA, in its discretion, elects to retain its own insurance advisor to analyze the extent of eligible premium increases, the Systems Integrator shall cooperate in good faith with any reasonable requests for additional information from the MBTA's insurance advisor.

(D) MBTA Determination. No later than 30 days after the MBTA's receipt of a Joint Insurance Cost Report pursuant to this Section 7.17, the MBTA shall make a written determination in respect of such Joint Insurance Cost Report as to whether there is an Exceptional Cost or an Exceptional Saving. In the event of a dispute, the MBTA's determination shall be subject to the Dispute Resolution Procedures.

(E) Exceptional Cost. If, following the MBTA's written determination pursuant to Section 17.7(D), it is agreed or determined that there is an Exceptional Cost, the MBTA shall within 45 days following such agreement or determination, make a one-off lump-sum payment to the Systems Integrator equal to eighty-five percent (85%) of the Exceptional Cost.

(F) Exceptional Saving. If, following the MBTA's written determination pursuant to Section 17.7(D), it is agreed or determined that there is an Exceptional Saving, the Systems Integrator shall within 45 days following such agreement or determination, make a one-off lump-sum payment to the MBTA equal to eighty-five percent (85%) of the Exceptional Saving.

(G) No Exceptional Cost and No Exceptional Saving. If, following the MBTA's written determination pursuant to Section 17.7(D), it is agreed or determined that there is neither an Exceptional Cost nor an Exceptional Saving, any Insurance Cost Differential shall be borne by or benefit the Systems Integrator.

ARTICLE 18

INDEMNIFICATION

SECTION 18.1. SYSTEMS INTEGRATOR'S INDEMNITY.

(A) Scope of Indemnity. Subject to subsection (B) of this Section, to the fullest extent permitted by Applicable Law, the Systems Integrator shall release, indemnify, defend and hold harmless the Indemnified Parties on demand from and against all Loss that any Indemnified Party may sustain in connection with:

- (1) The death, personal injury, disease or illness of any person, including any Indemnified Party;
- (2) Any loss of, or physical damage to, property or assets of any Indemnified Party, including the loss of use thereof; or
- (3) Third party actions, claims and fines, investigations, legal or administrative proceedings, penalties or demands brought against any Indemnified Party,

in each case, arising by reason or as a consequence of (or alleged to result from or in connection with) any:

- (4) Systems Integrator Fault;
- (5) Any Incident other than an Incident described in Item (19) of the definition of Compensation Event;
- (6) Noncompliance by any Systems Integrator Person with any Governmental Approval or Applicable Law;
- (7) Any Systems Integrator Hazardous Substance;
- (8) Labor disputes, as provided in Section 9.1(D);
- (9) Project Contractor or Subcontractor claims, as provided in Section 9.2(F);
- (10) Any claims of harassment arising from the conduct of any Systems Integrator Person; or
- (11) Intellectual Property claims, as provided in Section 16.6.

The Systems Integrator's indemnity obligations hereunder shall not be limited by any coverage exclusions, limits or other provisions in any policy of Required Insurance or other insurance maintained by the Systems Integrator which is intended to respond to such events.

(B) Limitation to Indemnity. Without limiting any right of the MBTA in respect of the Available Insurance, the Systems Integrator shall not be responsible for or obligated to indemnify the Indemnified Parties for Losses hereunder to the extent resulting directly from:

- (1) Supervening Events; or

- (2) The fraud, negligence, bad faith or willful misconduct of an Indemnified Party.

The requirement to provide an indemnity as specified in this Section shall not be interpreted to provide the MBTA with an alternative cause of action against the Systems Integrator for damages incurred directly by the MBTA as a result of a breach of this Project Agreement by the Systems Integrator.

(C) Limited MBTA Indemnity. Except as expressly provided in Article 16 (Intellectual Property Rights) in respect of Covered Systems Integrator Claims, neither the MBTA nor any other MBTA Entity shall have any obligation to indemnify any Systems Integrator Person.

SECTION 18.2. NOTICE OF CLAIMS. If any Indemnified Party receives notice of a claim or otherwise has actual knowledge of a claim that it believes is within the scope of the Systems Integrator's indemnities hereunder, the MBTA shall:

- (1) Provide the Systems Integrator with notice of any such claim of which it is aware (together with a copy of all written materials that the Indemnified Parties receive asserting such claim); provided, that no failure in providing such notice shall serve to waive any right to indemnification except to the extent that the Systems Integrator demonstrates, bearing the burden of proof, that it is prejudiced by such failure; and

- (2) Subject to Section 18.3:

- (a) Tender to any applicable insurers or the Systems Integrator, as applicable, the MBTA's defense of any claim resulting from the same; and

- (b) Use reasonable efforts to cause each other Indemnified Party to tender to any applicable insurers or the Systems Integrator, as applicable, such Indemnified Party's defense of any claim resulting from the same.

SECTION 18.3. TENDER OF DEFENSE.

(A) Applicable Insurers. Subject to subsection (F) of this Section, if the insurer under any policy of Required Insurance accepts tender of defense of any claim that is subject to the Systems Integrator's indemnification obligations hereunder (or that is otherwise subject to the applicable policy of Required Insurance) within the time required under Applicable Law, the Parties shall use reasonable efforts to cooperate in the defense proffered by such insurer and, for purposes of this Project Agreement, each applicable Indemnified Party shall be deemed an insured party under the relevant policy of Required Insurance.

(B) Systems Integrator. Subject to subsection (F) of this Section, if defense of any claim that is subject to the Systems Integrator's indemnification obligations hereunder is tendered to the Systems Integrator, then within 10 Business Days after receipt of such tender, the Systems Integrator shall notify the Indemnified Party whether it has tendered the claim to an insurer. If such claim is not tendered to an insurer, or if an insurer has rejected the tender, the Systems Integrator shall promptly, and in any event within 15 Business Days after receipt of such tender, notify the Indemnified Party whether the Systems Integrator:

- (1) Accepts the tender of defense and confirms that the claim is subject to full indemnification hereunder without any "reservation of rights" to deny or disclaim full indemnification thereafter;

(2) Accepts the tender of defense but with a “reservation of rights” in whole or in part; or

(3) Rejects the tender of defense based on a determination that it is not required to indemnify against the claim under the terms of this Project Agreement.

(C) Acceptance of Tender of Defense. If the Systems Integrator accepts the tender of defense pursuant to subsection (B)(1) or (B)(2) of this Section, then, subject to Section 18.3(F), the Systems Integrator shall have the right to select legal counsel for the Indemnified Party with the prior written consent of the Indemnified Party, shall be responsible for all Fees and Costs related to such defense, and shall control the defense of such claim, including settlement; provided, that the Indemnified Party’s consent shall be required prior to any settlement that would:

(1) Result in injunctive relief or other equitable remedies or otherwise require the Indemnified Party to comply with restrictions or limitations that adversely affect the Indemnified Party;

(2) Require the Indemnified Party to pay amounts that the Systems Integrator does not fund in full; or

(3) Not result in the Indemnified Party’s full and complete release from all liability to the plaintiffs or claimants who are parties to or otherwise bound by the settlement.

(D) Conduct of Defense. In connection with any defense conducted under subsection (C) of this Section:

(1) The Systems Integrator shall fully and regularly inform the Indemnified Party of the progress of the defense and of any settlement discussions; and

(2) The Indemnified Party shall, without prejudice to such Indemnified Party’s right to be indemnified by the Systems Integrator:

(a) Use reasonable efforts to cooperate in such defense, including by providing to the Systems Integrator all materials and access to personnel it reasonably requests as necessary for defense, preparation and trial and which or who are under the control of or reasonably available to the Indemnified Party, and

(b) Maintain the confidentiality of all communications between it and the Systems Integrator concerning such defense.

(E) Rejection of Tender of Defense. If the Systems Integrator rejects the tender of defense pursuant to subsection (B)(3) of this Section, then, the Indemnified Party shall be entitled to select its own counsel and control the defense of such claim, including the right to settle the claim without the Systems Integrator’s consent and without prejudice to such Indemnified Party’s right to be indemnified by the Systems Integrator.

(F) Right to Assume Defense. Notwithstanding subsection (C) of this Section, an Indemnified Party may assume its own defense at any time by delivering to the Systems Integrator notice of such election and the reasons therefor, if the Indemnified Party, at the time it gives notice of the claim or at any time thereafter, reasonably determines that:

(1) A conflict exists between it and the Systems Integrator which prevents or potentially prevents the Systems Integrator from presenting a full and effective defense;

(2) The Systems Integrator is otherwise not providing an effective defense in connection with the claim; or

(3) The Systems Integrator lacks the financial capacity to satisfy potential liability or to provide an effective defense.

(G) Conduct of Defense by Indemnified Party. If the Indemnified Party is entitled and elects to conduct its own defense pursuant hereto of a claim for which it is entitled to indemnification, the Systems Integrator shall reimburse on a current basis all Fees and Costs the Indemnified Party incurs in investigating and defending the claim. If the Indemnified Party is entitled to and elects to conduct its own defense, then, the Indemnified Party shall have the right to settle or compromise the claim:

(1) Without the Systems Integrator's consent and without prejudice to such Indemnified Party's right to be indemnified by the Systems Integrator under the circumstances described in subsection (E) of this Section; and

(2) In all other circumstances, with the Systems Integrator's prior written consent, which shall not be unreasonably withheld or delayed.

ARTICLE 19

SECURITY FOR PERFORMANCE

SECTION 19.1. SECURITY FOR CONTRACT SERVICES.

Without limiting anything under Section 19.2, to the extent the Systems Integrator obtains payment or performance security in respect of any Project Contractor's performance of Contract Services, the Systems Integrator shall cause the MBTA to be named, upon issuance of such security, as an additional obligee or beneficiary thereunder, and shall deliver a certified copy thereof, with the multiple obligee rider or other comparable documentation, to the MBTA within 10 days after issuance. The MBTA's rights in respect of any such security shall be subject to the rights of the Lenders under the Lenders' Remedies Agreement.

SECTION 19.2. PROJECT CONTRACT GUARANTORS.

Concurrently with the execution and delivery of each Project Contract by the Systems Integrator and a Project Contractor, the Systems Integrator shall require such Project Contractor to cause to be delivered to the Systems Integrator a Guaranty Agreement pursuant to which a Guarantor shall guarantee the performance of such Project Contract by the Project Contractor; provided that, the foregoing requirement shall not be applicable in the event that the Project Contractor is the ultimate parent entity. The rights and benefits of each such Guaranty Agreement shall be assignable, concurrent with a like assignment of the Project Contract, to the MBTA, or its designee, in accordance with the terms of the applicable Material Contract Direct Agreement.

ARTICLE 20

DISPUTE RESOLUTION PROCEDURES

SECTION 20.1. PROCESS AND REQUIREMENTS.

(A) Generally. Except as provided in Section 20.1(G) and Section 20.2, each Party shall follow the Dispute Resolution Procedures set forth in this Section to attempt to resolve and settle disputes between themselves concerning the rights, obligations and liabilities of the Parties. The Dispute Resolution Procedures set forth in this Article are intended to encourage a negotiated resolution of disputes in a prompt and efficient manner without resort to litigation, which should be a last resort.

(B) Informal Negotiations. Representatives of the Parties with day-to-day involvement in the administration of this Project Agreement and the performance of the Contract Services shall initially and promptly enter into negotiations to attempt to address and resolve any disputes that may arise concerning this Project Agreement. In connection with such negotiations, the Party asserting the dispute shall provide the other Party with a written description of the nature of the dispute, along with reasonable supporting documentation. The Parties shall consider involving senior representatives and other upper management personnel of each Party in the informal negotiation process, as well as other representatives of the Parties not actively involved in the day-to-day activities associated with the dispute who might be able to take a broader look at the dispute in the context of the overall objectives of the Project and this Project Agreement. At the MBTA's request, the Systems Integrator shall involve senior representatives of any of its Project Contractors or Subcontractors in such negotiations. Upon the expenditure of reasonable efforts towards resolution of a dispute through such informal negotiations without reaching agreement, a Party may declare that the informal negotiations have been exhausted and such Party may request Non-Binding Mediation or the Systems Integrator may request an MBTA Representative's Final Decision in accordance with this Section.

(C) MBTA Representative's Final Decision. If a dispute has not been resolved through direct, informal negotiations as provided in subsection (B) of this Section, then, upon the written request of the Systems Integrator, the MBTA Representative shall review the dispute and issue his or her determination of the dispute (the "**MBTA Representative's Final Decision**"). The MBTA Representative's Final Decision shall be issued in writing within 30 days following the date of the request for review. If the Systems Integrator disagrees with the MBTA Representative's Final Decision, or if the MBTA Representative fails to issue an MBTA Representative's Final Decision within such 30-day period, then the Systems Integrator shall have the right to file a notice of claim with the MBTA Representative. If the Systems Integrator fails to file any such notice of claim with the MBTA Representative within 90 days following the issuance of the MBTA Representative's Final Decision or, if not issued, the expiration of such 30-day period, then the Systems Integrator shall:

- (1) Be deemed to have accepted the MBTA Representative's Final Decision;
- (2) Have waived its rights to any further relief for the matters covered by such MBTA Representative's Final Decision; and
- (3) Have waived its rights to initiate Legal Proceedings in accordance with Section 20.3 and this Project Agreement for the matters in dispute between the Parties.

Except as provided in Section 20.2, an MBTA Representative's Final Decision, or the failure of the MBTA Representative to issue an MBTA Representative's Final Decision in accordance with this Section 20.1(C), shall be a condition precedent to the Systems Integrator's right to file a notice of claim, and

subsequently initiate Legal Proceedings, in accordance with this Project Agreement; provided that, the Systems Integrator shall have the right, at any time following the expenditure of reasonable efforts towards resolution of a dispute through informal negotiation pursuant to Section 20.1(B), to seek specific performance of any obligation under this Project Agreement or injunctive relief in accordance with Section 20.3.

(D) Rights to Request and Decline Non-Binding Mediation. Subject to the requirements of Section 20.1(B) and Section 20.2(A), either Party may request Non-Binding Mediation of any dispute arising under this Project Agreement, whether technical in nature or otherwise. Non-Binding Mediation is voluntary and will not be a condition precedent to initiating the institution of Legal Proceedings by either Party. The non-requesting Party may decline the request in its sole discretion. If there is concurrence that any particular matter shall be mediated, the provisions of this Section shall apply. The costs of such Non-Binding Mediation shall be divided equally between the Parties.

(E) Procedure. The Mediator shall be a professional engineer, attorney or other professional mutually acceptable to the Parties who has no current or on-going relationship to either Party. The Mediator shall have full discretion as to the conduct of the mediation. Each Party shall participate in the Mediator's program to resolve the dispute until and unless the Parties reach agreement with respect to the disputed matter or one Party determines in its sole discretion that its interests are not being served by the mediation.

(F) Non-Binding Effect. Mediation is intended to assist the Parties in resolving disputes over the correct interpretation of this Project Agreement. No Mediator shall be empowered to render a binding decision.

(G) Relation to Judicial Legal Proceedings. Except as provided in Section 20.1(C) with respect to the MBTA Representative's Final Decision and without limiting any requirement under Section 20.2, nothing in this Section shall operate to limit, interfere with or delay the right of either Party to commence Legal Proceedings upon a breach of this Project Agreement by the other Party, whether in lieu of, concurrently with, or at the conclusion of any Non-Binding Mediation.

SECTION 20.2. DB DISPUTE REVIEW BOARD.

(A) Establishment and Scope. The Parties shall establish a dispute review board (the **"DB Dispute Review Board"**) in accordance with Appendix 16 (DB Dispute Review Board) and this Section to provide expertise and assist in and facilitate the timely and equitable resolution of disputes between the Parties concerning the DB Installation Work, including any dispute concerning the coordination of, conflicts between, and delays associated with, the DB Installation Work and the SI Installation Work (any such dispute, a **"DB Dispute"**). The Parties shall use all reasonable efforts to establish the DB Dispute Review Board within 210 days following the Effective Date, and the DB Dispute Review Board shall remain in existence until the achievement of both (i) the Full Service Commencement Date and (ii) final completion of all DB Installation Work; provided that, if any DB Dispute remains pending as of such achievement, the DB Dispute Review Board shall remain in existence until the date which is 60 days following the issuance of its recommendation concerning such DB Dispute in accordance with this Section. The authority and administrative procedures of the DB Dispute Review Board are set forth in Appendix 16 (DB Dispute Review Board). The Parties agree that any DB Dispute shall be governed by the terms and conditions of this Section and shall not be subject to the Non-Binding Mediation provisions of Section 20.1 or any requirement under Section 20.1(C).

(B) Referral of Dispute. Following the expenditure of reasonable efforts towards resolution of a dispute through informal negotiation pursuant to Section 20.1(B), either Party may by

written notice to the other Party and to the DB Dispute Review Board, refer any DB Dispute to the DB Dispute Review Board in accordance with the following procedures:

(1) Upon submittal by either Party of the matter to the DB Dispute Review Board, the DB Dispute Review Board will decide when to conduct the hearing; provided that, the DB Dispute Review Board shall hold the hearing within 20 days of the referral, unless the Parties agree to a longer time period.

(2) Either Party may furnish written evidence or documentation to the DB Dispute Review Board regarding the DB Dispute. If either Party furnishes such information to the DB Dispute Review Board, it shall simultaneously furnish copies of such information to the other Party. If the DB Dispute Review Board requests any additional documentation or evidence prior to, during, or after the hearing, the relevant Party shall provide the requested information to the DB Dispute Review Board and to the other Party, in accordance with the deadlines set by the DB Dispute Review Board.

(3) The Systems Integrator and the MBTA will each be afforded a reasonable opportunity to be heard by the DB Dispute Review Board and to offer evidence. Neither the MBTA nor the Systems Integrator may present information at the hearing that was not previously distributed to both the DB Dispute Review Board and the other Party.

(4) The DB Dispute Review Board's recommendations for resolution of the DB Dispute will be given in writing to both the MBTA and the Systems Integrator within 15 days after completion of the hearings. In cases of substantial complexity, both Parties may agree, by written notice to the DB Dispute Review Board signed by authorized representatives of both Parties, to allow additional time for the DB Dispute Review Board to formulate its recommendations.

(5) Within 15 days of receiving the DB Dispute Review Board's recommendations, both the MBTA and the Systems Integrator shall respond to the other and to the DB Dispute Review Board in writing, signifying either acceptance or rejection of the DB Dispute Review Board's recommendations. The failure of either Party to respond within such 15-day period shall be deemed an acceptance of the DB Dispute Review Board's recommendations by that Party.

(6) The recommendations of the DB Dispute Review Board shall be final and binding only to the extent the Parties accept such recommendations, either expressly or to the extent deemed accepted by virtue of that Party's failure to respond within such 15-day period. If the Parties accept (or are deemed to have accepted) any recommendation of the DB Dispute Review Board in accordance with this Section, each Party shall (unless otherwise specified in the relevant recommendation) give effect to such recommendation as soon as is reasonably practicable.

(7) Should the DB Dispute remain unresolved, either Party may seek reconsideration of the decision by the DB Dispute Review Board only when there is new evidence to present.

(C) Relation to Judicial Legal Proceedings. The MBTA and the Systems Integrator agree that, except as expressly provided in this Section 20.2(C), the submission of any unresolved DB Dispute to the DB Dispute Review Board and the issuance of, or a failure to issue, a recommendation by the DB Dispute Review Board in accordance with this Section is a condition precedent to the MBTA or the Systems Integrator having the right to commence Legal Proceedings in respect of such unresolved DB Dispute. If a recommendation by the DB Dispute Review Board is not accepted (or deemed to have been

accepted) by both Parties pursuant to Section 20.2(B)(5) or, if accepted by both Parties, a Party does not give effect to such recommendation in accordance with Section 20.2(B)(6), either Party shall have the right to commence Legal Proceedings in respect of such DB Dispute in accordance with Section 20.3. Notwithstanding the foregoing, at any time following the expenditure of reasonable efforts towards resolution of a DB Dispute through informal negotiation pursuant to Section 20.1(B), either Party may seek specific performance of any obligation under this Project Agreement or injunctive relief in accordance with Section 20.3.

(D) Joinder of Disputes. If any DB Dispute raises issues that relate to any dispute between the MBTA and the DB Entity, then the MBTA may join as part of its submissions made to the DB Dispute Review Board any such dispute between the MBTA and the DB Entity. Any submission made by the DB Entity shall be made within the time limits applicable to the delivery of submissions by the MBTA and concern only those matters which relate to the DB Dispute under this Project Agreement. The Systems Integrator shall have no liability to the DB Entity arising out of or in connection with any decisions of the DB Dispute Review Board or in respect of the costs incurred by the DB Entity as a result of the DB Entity participating in the resolution of any dispute hereunder.

SECTION 20.3.FORUM FOR LEGAL PROCEEDINGS. It is the express intention of the Parties that all Legal Proceedings related to this Project Agreement or to the Project or to any rights or any relationship between the Parties arising therefrom shall be solely and exclusively initiated and maintained in state or federal courts located in the City of Boston, County of Suffolk, Commonwealth of Massachusetts. The Systems Integrator and the MBTA each irrevocably consents to the jurisdiction of such courts in any such Legal Proceeding and waives any objection it may have to the laying of the jurisdiction of any such Legal Proceeding. Without limiting the effectiveness of any other method of service allowed by law, the Parties irrevocably consent to service of process by personal delivery, certified mail, postage prepaid or overnight courier in relation to any Legal Proceedings. The Parties agree that the Dispute Resolution Procedures under this Article exclusively govern claims under this Project Agreement.

SECTION 20.4.CONTINUANCE OF PERFORMANCE DURING DISPUTE. Unless otherwise directed in writing by the MBTA and subject to the Systems Integrator's rights under Section 11.1(F), at all times during the course of any Dispute Resolution Procedure or Legal Proceeding, the Systems Integrator shall continue with the performance of the Contract Services in a diligent manner and in accordance with the applicable provisions of this Project Agreement. The MBTA shall continue to satisfy its uncontested payment obligations to the Systems Integrator during the pendency of any such dispute, subject to the terms and conditions of this Project Agreement. Records of the Contract Services performed during such time shall be kept in accordance with the applicable provisions of this Project Agreement.

SECTION 20.5.COSTS OF DISPUTE RESOLUTION. Each Party shall bear its own costs and expenses, including attorney's fees, in any dispute arising out of this Project Agreement, except as expressly provided for herein or pursuant to the terms of any binding dispute resolution.

ARTICLE 21

REMEDIES OF THE PARTIES AND MBTA STEP-IN RIGHTS

SECTION 21.1. REMEDIES FOR BREACH.

(A) Generally. Except as otherwise provided in this Section 21.1 and subject to all other terms and conditions of this Project Agreement, the Parties agree that in the event that either Party breaches this Project Agreement, the other Party may exercise any legal rights it may have under this Project Agreement and under Applicable Law. Neither Party shall have the right to terminate this Project Agreement except as provided or referred to in Article 24 (Termination).

(B) Remedies Available to the Systems Integrator. Without prejudice to any legal right or entitlement of the Systems Integrator to specific performance or injunctive relief, the Systems Integrator's sole remedy in relation to matters for which an express right or remedy is stated in this Project Agreement shall be that express right or remedy, and the Systems Integrator shall have no additional right or remedy arising by common law, in equity, by statute or otherwise. Without limiting the generality of the preceding sentence, the Systems Integrator's sole remedy in relation to any Supervening Event shall be as stated in Article 13 (Supervening Events) and in Section 24.6.

(C) MBTA Remedies Cumulative. Except to the extent expressly provided in this Project Agreement, including under Section 21.1(D), the rights and remedies of the MBTA hereunder are cumulative and are in addition to and not in substitution for any other rights and remedies available at law or in equity or otherwise.

(D) MBTA Liquidated Damage Rights. The MBTA's rights under this Project Agreement include the right (each of the following, a "**Liquidated Damage Right**"):

- (1) To retain the proceeds of a draw on the Financial Close Security under the circumstances set forth in Appendix 14 (Financial Close Procedures and Conditions);
- (2) To impose and collect liquidated damages under the circumstances set forth in Section 6.4(C) and Section 6.11(I); and
- (3) To impose Deductions from the Availability Payments under the circumstances set forth in Appendix 8 (Payment Mechanism).

The Parties acknowledge and agree that the MBTA's actual damages or losses in each such circumstance are impossible to ascertain as of the Effective Date and that the amounts payable to, or to be retained by, the MBTA through the exercise of any Liquidated Damage Right are a fair and reasonable estimate of fair compensation to the MBTA for the intended circumstance, as applicable, shall constitute liquidated damages in each such circumstance and are not a penalty against the Systems Integrator. The Systems Integrator is expressly estopped from claiming, and waives any right to claim, that the exercise of any Liquidated Damage Right by the MBTA amounts to a penalty or is not enforceable. The liquidated damages resulting from the MBTA's exercise of a Liquidated Damage Right shall constitute the only damages payable by the Systems Integrator to the MBTA to compensate the MBTA for the damages or losses resulting from the specific circumstances contemplated by such Liquidated Damage Right, and the exercise of such right by the MBTA, the MBTA's sole remedy in respect of such circumstances; provided that, such limitation is without prejudice to:

- (4) Any entitlement of the MBTA to specific performance of any obligation of the Systems Integrator under this Project Agreement;
- (5) Any entitlement of the MBTA to injunctive relief;
- (6) Subject to Section 18.1(B), the Systems Integrator's indemnification obligations under Article 18 (Indemnification) in respect of third-party claims;
- (7) The Systems Integrator's obligations to deposit Fare Revenue pursuant to Appendix 4.2;
- (8) The determination or Systems Integrator liability in respect of any Cost to Complete or Maintenance Rectification Costs pursuant to Appendix 13 (Termination Compensation); or
- (9) Any other express right of the MBTA pursuant to this Project Agreement.

SECTION 21.2. NO DUPLICATIVE RECOVERY.

Notwithstanding any other provision of this Project Agreement to the contrary, neither Party shall be entitled to recover compensation or make a claim under this Project Agreement in respect of any loss that it has incurred to the extent that it has already been compensated in respect of that loss pursuant to this Project Agreement or otherwise.

SECTION 21.3. WAIVER OF REMEDIES.

No failure to exercise, and no delay in exercising, any right or remedy under this Project Agreement will be deemed to be a waiver of that right or remedy. No waiver of any breach of any provision of this Project Agreement will be deemed to be a waiver of any subsequent breach of that provision or of any similar provision. Except as expressly provided in this Project Agreement, no single or partial exercise by a Party of any right or remedy precludes or otherwise affects the exercise of any other right or remedy to which that Party may be entitled.

SECTION 21.4. WAIVER OF CONSEQUENTIAL DAMAGES.

Except as expressly provided in this Section, in no event shall either Party be liable to the other or obligated in any manner to pay to the other Party any special, incidental, consequential, punitive or similar losses or damages (including, except as otherwise provided in this Section 21.4, loss of Fare Revenue, loss of profits, loss of production, loss of business opportunity or other consequential or indirect loss) based upon claims arising out of or in connection with the performance or non-performance of its obligations or otherwise under this Project Agreement, or any representation made in this Project Agreement being materially incorrect, whether such claims are based upon contract, tort, negligence, warranty or any other legal theory. The foregoing limitation on each Party's liability shall not apply to or limit recovery in respect of:

- (1) The Systems Integrator's liability for:
 - (a) Any liquidated damage amount resulting from the exercise by the MBTA of any Liquidated Damage Right;

- (b) Claims, losses or damages, including any Loss, to the extent the same is required to have been covered by Available Insurance;
 - (c) Amounts payable by the Systems Integrator under its indemnification obligations hereunder in respect of third-party claims;
 - (d) Fare Revenues to the extent required to be deposited pursuant to Appendix 4.2; or
- (2) Either Party's liability for losses or damages arising out of fraud, willful misconduct, criminal conduct or bad faith on the part of the other Party.

SECTION 21.5. MBTA STEP-IN RIGHTS.

(A) Right to Step-In. Without limiting any other right of the MBTA hereunder, if the MBTA reasonably believes that it needs to take action in connection with the System or any aspect of the Contract Services because:

- (1) A Systems Integrator Event of Default has occurred;
- (2) Any unforeseen event affecting the Project, whether directly or indirectly, has occurred or is reasonably likely to occur which:
 - (a) Causes or is reasonably likely to cause material disruption to the Transportation Network or a material threat to the safety or security of the Users;
 - (b) Is an immediate or imminent threat to the long-term integrity of any part of the System, the Transportation Network, the environment or to any property adjacent to the Locations; or
 - (c) Is recognized or declared as an emergency by any Governmental Body with legal authority to recognize or declare an emergency; or
- (3) The Systems Integrator has failed to comply with any safety related Applicable Law within a reasonable period of time under the circumstances; then

Subject to the rights of the Lenders under the Lenders' Remedies Agreement, the MBTA shall be entitled to take action in accordance with this Section 21.5.

(B) Notice. If the MBTA has the right under Section 21.5(A) and elects to take action, the MBTA shall provide reasonable advance written notice to the Systems Integrator, which notice shall include:

- (1) A description of any action that the MBTA reasonably believes it is necessary for the MBTA to take;
- (2) The reason for such action;
- (3) The date the MBTA intends to take such action;

(4) The time period the MBTA reasonably believes will be necessary for such action;
and

(5) To the extent practicable, the effect on the Systems Integrator and its obligation to carry out the Contract Services during the period such action is being undertaken by the MBTA; provided that:

The MBTA shall have no obligation to provide such reasonable advance written notice prior to taking action under circumstances of a Systems Integrator Event of Default or where the MBTA reasonably believes that emergency action is necessary. If reasonable advance written notice is not required under this Section 21.5(B), the MBTA shall notify the Systems Integrator upon taking action and shall use reasonable efforts to provide the Systems Integrator with the information otherwise required under this Section 21.5(B).

(C) MBTA Step-In Action. Following notice as and to the extent required under Section 21.5(B), the MBTA shall take such action as the MBTA has notified the Systems Integrator it will take under Section 21.5(B) and any consequential additional action the MBTA reasonably believes is necessary (together, the “**MBTA Step-In Action**”). The Systems Integrator acknowledges and agrees that, to the extent of any MBTA Step-In Action in accordance with this Section, the MBTA shall have the right to take exclusive possession of all or part of the System, to perform or cause the performance by any MBTA Person of all or any portion of the Contract Services, and to suspend or revoke the Systems Integrator’s right to possess and perform the same. The Systems Integrator hereby grants, and shall cause each other Systems Integrator Person to grant, the MBTA and all necessary MBTA Persons, as determined in the discretion of the MBTA, the right of entry onto any property or premises of any Systems Integrator Person for the purpose of taking any MBTA Step-In Action in accordance with this Section. The Systems Integrator shall use all reasonable efforts to provide assistance to the MBTA in connection with any MBTA Step-In Action, as and to the extent requested by the MBTA. The MBTA shall provide the Systems Integrator with prompt notice of completion of any MBTA Step-In Action.

(D) Compensation Event Relief. Except to the extent resulting from any Systems Integrator Fault, any MBTA Step-In Action shall be a Compensation Event.

(E) Systems Integrator Fault. To the extent any MBTA Step-In Action results from any Systems Integrator Fault, after giving effect to any cure period available hereunder in respect of such Systems Integrator Fault and without prejudice to any other right of the MBTA hereunder, the Systems Integrator shall be responsible for, and shall pay the MBTA, the reasonable cost and expense incurred by the MBTA in taking, or as a result of taking, the MBTA Step-In Action. Any such payment shall be due within 30 days following the receipt by the Systems Integrator of an invoice therefor from the MBTA.

SECTION 21.6. INCIDENT STOP ORDER.

(A) Right to Issue. Without limiting any other right of the MBTA hereunder, in the event of the occurrence of any Incident involving Level 0 Data, Level 1 Data or Level 2 Data, as such terms are defined in Appendix 3.1A, the MBTA shall have the right, following written notice to and consultation with the Systems Integrator, to direct the Systems Integrator to make the System, or any System Element, unavailable to all or any of the Users for such period of time as the MBTA reasonably determines necessary under the circumstances to mitigate the impact of the Incident. The Systems Integrator shall promptly comply with such written directive and, during the period and to the extent of such unavailability, shall permit the MBTA to provide for Transportation Services without the collection of Fares or by collecting Fares through means other than the System, as specified by the MBTA in its

discretion. No such written directive shall serve to relieve the Systems Integrator from its obligations under Appendix 3.1 in respect of any such Incident or from performing any Operating Services not affected by the directive.

(B) Responsibility for Deductions; MBTA Change. Except to the extent any such Incident qualifies as a Compensation Event under Item (19) of the definition thereof, the Systems Integrator shall be responsible for all Deductions associated with any such unavailability until such time as the Systems Integrator effectuates a cure of the Incident in accordance with the Contract Standards. To the extent such Incident qualifies as a Compensation Event under Item (19) of the definition thereof or the MBTA requires the unavailability of the System beyond the date on which the Systems Integrator has effectuated a cure of the Incident in accordance with the Contract Standards, a written directive by the MBTA pursuant to this Section 21.6 shall be an MBTA Change. Under no other circumstances shall the issuance of any written directive by the MBTA in accordance with this Section 21.6 constitute an MBTA Change or serve as a basis for Supervening Event relief hereunder.

SECTION 21.7. SI REMEDIES FOR NONPAYMENT.

In the event of the occurrence of an MBTA Event of Default described in Section 23.1(A)(1), inclusive of (a) and (b) thereof, the Systems Integrator shall have the right, by written notice to the MBTA, to suspend performance of the Operating Services until such time as the MBTA cures such MBTA Event of Default. Such right to suspend performance shall be in addition to the right of the Systems Integrator to terminate this Project Agreement for such MBTA Event of Default under Section 24.4, and the exercise of such right by the Systems Integrator shall not serve as grounds for:

- (1) Abandonment of the Project under Section 22.1(A)(6), any Remediable Breach or any Systems Integrator Fault; or
- (2) Except to the extent necessary to protect the health and safety of the Users or to provide for Transportation Services without the collection of Fares, any MBTA Step-In Action.

SECTION 21.8. REMEDIES FOR MUTUAL BREACH OF WARRANTY.

Notwithstanding any other provision of this Project Agreement, if there exists or occurs any circumstance or event that constitutes or results in a concurrent breach of any of the parallel representations and warranties set forth in Article 2 (Representations and Warranties) by both the Systems Integrator and the MBTA but does not also constitute or result in any other breach or default by either Party, then:

- (1) Such breaches shall not form the basis for a Supervening Event or a damages claim by either Party against the other; and
- (2) The only remedies available to the Parties shall be to:
 - (a) Take action to rectify or mitigate the effects of such circumstance or event;
 - (b) If applicable, pursue severance and reformation of this Project Agreement in accordance with Section 1.2(U);
 - (c) Pursue a Termination by Court Ruling as set forth in Section 24.5; or

- (d) Exercise their waiver rights hereunder.

ARTICLE 22

SYSTEMS INTEGRATOR DEFAULT

SECTION 22.1. SYSTEMS INTEGRATOR EVENT OF DEFAULT.

(A) Definition. For the purposes of this Project Agreement, a “**Systems Integrator Event of Default**” means any of the following acts, events or circumstances:

(1) The occurrence of a Remediable Breach that is not cured in accordance with Section 22.2;

(2) The failure of the Systems Integrator to achieve the Full Service Commencement Date by the Longstop Date;

(3) The failure of the Systems Integrator to deposit, or cause the deposit of, Fare Revenues to the account designated by the MBTA in accordance with the requirements specified in Appendix 4.2 if the Systems Integrator has not cured such failure within five Business Days after the MBTA delivers written notice to the Systems Integrator of such failure;

(4) The failure of the Systems Integrator to comply with a written directive issued by the MBTA in accordance with Section 21.6 within five Business Days following the date specified in any such written directive;

(5) The cumulative Deductions, after accounting for any Earn Back and calculated in accordance with Appendix 8 (Payment Mechanism), exceed:

(a) 20% of the cumulative Base Monthly Payments over any three-month period;

(b) 15% of the cumulative Base Monthly Payments over any six-month period;

(c) 10% of the cumulative Base Monthly Payments over any 12-month period; or

(d) 7.5% of the cumulative Base Monthly Payments over any 24-month period;

(6) The Systems Integrator abandons the Project either:

(a) By demonstrating through statements, acts or omissions an intent not to perform, or continue to perform, all or a material part of the Contract Services, unless such intent is otherwise expressly permitted or excused by the terms of this Project Agreement; or

(b) By failing to perform a material part of the Contract Services for a continuous period of 30 days where such failure is not consistent with the Project Schedule, as applicable, and is not expressly permitted or excused by the terms of this Project Agreement;

(7) A failure of compliance with the Contract Standards in respect of health and safety by the Systems Integrator directly results in an order to shut down a Station or Gate Array by a Governmental Body with jurisdiction;

(8) The Systems Integrator breaches Section 15.1 or a Change of Control occurs which is prohibited under Section 15.2;

(9) A Bankruptcy Related Event occurs in respect of the Systems Integrator;

(10) A Bankruptcy Related Event occurs in respect of:

(a) Any Project Contractor prior to the completion of all work or services contemplated under its Project Contract, unless, within 90 days following the occurrence of such Bankruptcy Related Event, the Systems Integrator replaces such Project Contractor by entering into a replacement Project Contract pursuant to Sections 9.3 and 9.4 hereof with a reputable counterparty reasonably acceptable to the MBTA; or

(b) Any Guarantor prior to the completion of all work or services contemplated under the relevant Project Contract unless, within 90 days after the occurrence of such Bankruptcy Related Event:

(i) The Systems Integrator replaces such Guarantor by providing for a replacement Guaranty Agreement pursuant to Sections 9.3 and 9.4 hereof with a reputable counterparty reasonably acceptable to the MBTA;

(ii) The Systems Integrator has provided replacement security for such Guaranty Agreement in the form of a cash deposit or letter of credit reasonably acceptable to the MBTA, in each case, in an amount equal to the maximum liability specified in such Guaranty Agreement, if any, or, absent such specification, the estimated maximum liability of the Guarantor under such Guaranty Agreement, as reasonably determined by the MBTA; or

(iii) The Systems Integrator demonstrates to the reasonable satisfaction of the MBTA that the relevant Project Contractor (taking into account any other guaranties of such Project Contract) possesses the financial and technical capability to complete all remaining work under the relevant Project Contract in accordance with its terms without such Guarantor;

(11) The termination of a Material Contract prior to the completion of all work or services contemplated by the Material Contract, unless, within 150 days after any such termination, the Systems Integrator enters into a replacement Material Contract pursuant to Sections 9.3 and 9.4 hereof with a reputable counterparty reasonably acceptable to the MBTA; or

(12) After exhaustion of all rights of appeal, there occurs any suspension or debarment, or there comes into effect any agreement for voluntary exclusion, from bidding, proposing or contracting with any federal or Commonwealth department or agency in respect of:

(a) Any Equity Member with a material financial obligation owing to the Systems Integrator;

(b) Any Project Contractor or Guarantor prior to the completion of all work or services contemplated under the relevant Project Contract, unless, within 90 days after the relevant suspension, debarment or exclusion:

(i) In the case of a Project Contractor, the Systems Integrator replaces such Project Contractor by entering into a replacement Project Contract pursuant to Sections 9.3 and 9.4 hereof with a reputable counterparty reasonably acceptable to the MBTA; and

(ii) In the case of a Guarantor, the Systems Integrator satisfies any of the conditions specified in Section 21.1(A)(10)(b)(i)-(iii); or

(c) Any other Systems Integrator Person that remains a Systems Integrator Person 90 days after the relevant suspension, debarment or exclusion.

(B) Notice by Systems Integrator. The Systems Integrator shall provide written notice to the MBTA of the occurrence of any Systems Integrator Event of Default and of any event or circumstance that is reasonably likely, with the passage of time or otherwise, to constitute or give rise to a Systems Integrator Event of Default, in either case, promptly upon becoming aware of the same. No failure of the Systems Integrator to provide notice in accordance with this Section shall serve to limit any right or remedy of the MBTA hereunder.

SECTION 22.2. REMEDIABLE BREACH.

(A) Definition. For purposes of this Project Agreement, a “**Remediable Breach**” means any of the following, in each case, without limiting any Systems Integrator Event of Default identified in Section 22.1(A) other than Section 22.1(A)(1):

(1) A failure by the Systems Integrator to:

(a) Pay any amount (other than Fare Revenues) due and owing to the MBTA pursuant or in relation to this Project Agreement on the due date therefor, unless such payment is being disputed in good faith by the Systems Integrator; or

(b) To deposit funds in the Handback Reserve Account in accordance with the requirements of this Project Agreement;

(2) A failure by any Systems Integrator Person to obtain, provide, maintain and deliver required evidence of any insurance, bonds, guarantees, letters of credit or other payment or performance security as and when required under this Project Agreement for the benefit of relevant parties, or to comply with any requirement of this Project Agreement pertaining to the amount, terms or coverage of the same, including in respect of any Required Insurance or Guaranty Agreement;

(3) Any Incident other than an Incident described in Item (19) of the definition of Compensation Event;

(4) Any Systems Integrator Person fails to comply with Applicable Law in any material respect;

(5) Any representation or warranty in this Project Agreement made by the Systems Integrator, or in any certificate, schedule, report, instrument, agreement or other document delivered by or on behalf of the Systems Integrator to the MBTA pursuant to this Project Agreement, is false, misleading or inaccurate in any material respect when made or omits material information when made;

(6) The Independent Certifier confirms in writing at any time following the first anniversary of the Effective Date that the Systems Integrator is not reasonably likely to achieve the Full Service Commencement Date by the Longstop Date; or

(7) Any breach by the Systems Integrator of any other material obligation under this Project Agreement (other than a Performance Failure, System Availability Failure or any breach that arises as a direct result of the occurrence of a Supervening Event) or any written repudiation of this Project Agreement by the Systems Integrator.

(B) Notice and Cure Period. Subject to Section 22.2(C), as applicable, the Systems Integrator shall have a period of 30 days to cure any Remediable Breach after the MBTA delivers written notice of such Remediable Breach.

(C) Extension of Cure Period. With respect to any Remediable Breach that is identified in numbers (4), (5), (6) or (7) of Section 22.2(A), if:

(1) The Systems Integrator reasonably determines that the specific breach is of such a nature that the cure cannot with diligence reasonably be effected within the period specified in Section 22.2(B); and

(2) The Systems Integrator has within 10 days of the start of such period proposed a rectification plan reasonably acceptable to the MBTA; then

(3) The cure period shall be extended so that it expires on the earliest to occur of:

(a) The latest date reasonably necessary to effect the cure, as set forth in the accepted rectification plan;

(b) 150 days after the date of the start of the cure period; or

(c) The date on which the Systems Integrator ceases its diligent and good faith efforts to cure such breach in accordance with the accepted rectification plan.

The Systems Integrator acknowledges and agrees that the cure period for a Remediable Breach that is identified in numbers (1), (2) or (3) of Section 22.2(A) is not subject to extension under this Section and that no Systems Integrator Event of Default is subject to any further cure period absent the written agreement of the MBTA in its discretion.

(D) Cure of Misrepresentation Breach. Any cure of a Remediable Breach under Section 22.2(A)(5) will be deemed complete only when all necessary disclosures have been made and all adverse effects, if any, caused by such Remediable Breach have been cured.

SECTION 22.3.MBTA REMEDIES UPON SYSTEMS INTEGRATOR EVENT OF
DEFAULT.

If any Systems Integrator Event of Default occurs, the MBTA may in its discretion, subject to the rights of the Lenders under the Lenders' Remedies Agreement, exercise any rights and remedies available to the MBTA so long as such Systems Integrator Event of Default continues, including exercising its step-in rights pursuant to Section 21.5 and terminating this Project Agreement pursuant to Section 24.3.

ARTICLE 23

MBTA EVENTS OF DEFAULT

SECTION 23.1. MBTA EVENTS OF DEFAULT.

(A) Definition. For purposes of this Project Agreement, an “**MBTA Event of Default**” means any of the following acts, events or circumstances:

(1) The MBTA fails to make any payment due to the Systems Integrator under this Project Agreement when due, and:

(a) Such payment is not being disputed in good faith by the MBTA; and

(b) The MBTA has not cured such failure of payment within 30 days after the Systems Integrator delivers written notice to the MBTA of such failure of payment;

(2) The MBTA fails to observe or perform substantially all of its obligations under this Project Agreement, which substantially frustrates or renders it substantially impossible for the Systems Integrator to perform its obligations under this Project Agreement, or substantially increases the costs and fees associated therewith, for a continuous period of 60 days, and:

(a) Such failure is not directly attributable to a Force Majeure Event; and

(b) The MBTA has not cured such failure within 30 days after the Systems Integrator delivers written notice to the MBTA of such failure of performance;

(3) The MBTA fails to enter into a DB Contract within 270 days following the submittal by the Systems Integrator of the Complete DB Plans and Specifications in compliance with the Contract Standards or, having entered into the DB Contract, terminates or permits the termination of the DB Contract prior to the completion of the DB Installation Work, unless:

(a) Such failure or termination is directly attributable to a Force Majeure Event; or

(b) In the case of a failure to enter into a DB Contract, the MBTA has cured such failure within 30 days after the Systems Integrator delivers written notice of such failure of performance, which cure may be effectuated by entering into a DB Contract or by demonstrating that the MBTA will perform or provide for the performance of the DB Installation Work by other means; or

(c) In the case of a termination of the DB Contract, within 150 days after any such termination, the MBTA enters into a replacement DB Contract or otherwise provides for the continued performance of the DB Installation Work by other means;

(4) Any representation or warranty made by the MBTA under Section 2.1 is false, misleading or inaccurate in any material respect when made, and the MBTA has not cured the same within the period specified in Section 23.1(B); or

(5) A failure of the MBTA to comply with Section 15.3.

(B) Cure Period for Misrepresentation Breach. With respect to Section 23.1(A)(4), the MBTA shall have a period of 60 days after the Systems Integrator delivers written notice of the applicable breach to cure the applicable breach; provided that, if:

(1) The MBTA reasonably determines that the specific breach is of such a nature that the cure cannot with diligence be effected within such period and notifies the Systems Integrator of such determination prior to the expiration of such period; and

(2) The MBTA commences meaningful steps to cure the applicable breach promptly after receiving written notice of the same; then:

(3) The cure period shall be extended so that it expires on the earliest to occur of:

(a) The latest date reasonably necessary to effect the cure; and

(b) 150 days after the date of the start of the cure period.

The MBTA acknowledges and agrees that the no other cure period prior to determination of an MBTA Event of Default, as set forth in Section 23.1(A), is subject to extension under this Section 23.1(B) and that no MBTA Event of Default is subject to any further cure period absent the written agreement of the Systems Integrator in its discretion.

(C) Cure of Misrepresentation Breach. Any cure of a breach under Section 23.1(B) will be deemed complete only when all necessary disclosures have been made and all adverse effects, if any, caused by such breach have been cured.

SECTION 23.2. SI REMEDIES UPON MBTA EVENT OF DEFAULT.

Without limiting any right under Section 21.7, if any MBTA Event of Default occurs, the Systems Integrator may terminate this Project Agreement pursuant to Section 24.4.

ARTICLE 24

TERMINATION

SECTION 24.1. EXCLUSIVE RIGHTS OF TERMINATION.

(A) Prior to Financial Close Date. Prior to the Financial Close Date, the Parties' sole rights to terminate this Agreement shall be as set forth in Appendix 14 (Financial Close Procedures and Conditions).

(B) Subsequent to Financial Close Date. Without limiting anything under Section 24.1(A), this Article 24 (Termination), together with the other provisions of this Agreement expressly referred to in this Article 24 (Termination) and the provisions of the Lenders' Remedies Agreement, contain the entire and exclusive provisions and rights of the Parties regarding termination of this Project Agreement, and any and all other rights to terminate at law or in equity are hereby waived to the maximum extent permitted by Applicable Law; provided that, termination of this Project Agreement shall not relieve the Systems Integrator, or any Guarantor, insurer or any surety or other financial institution that provides security for performance pursuant to Section 19.1 of its obligation for any claims arising prior to termination.

(C) MBTA Exercise of Termination Rights. The MBTA shall obtain the approval of its governing board, as established by the Act, prior to exercising any right of termination under this Project Agreement.

SECTION 24.2. TERMINATION FOR CONVENIENCE.

(A) MBTA Right. The MBTA may, in its discretion and for its convenience, terminate this Project Agreement at any time on or before the Expiration Date by delivering to Systems Integrator a written notice to such effect (a "**Termination for Convenience**").

(B) Termination Date. A Termination for Convenience shall be effective on the date specified in the MBTA's written notice of Termination for Convenience.

(C) Termination Amount. In the event of any Termination for Convenience, the MBTA shall pay the Systems Integrator the applicable Termination Amount in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

(D) Consideration for Convenience Termination Amount. The right of the MBTA to terminate this Project Agreement for its convenience and in its discretion in accordance with this Section constitutes an essential part of the overall consideration for this Project Agreement, and, without limiting any right of the Systems Integrator in respect of its entitlement to the Termination Amount under Section 24.2(C), the Systems Integrator hereby waives any right it may have under Applicable Law to assert that the MBTA owes the Systems Integrator any duty of good faith or fair dealing in the exercise of such right.

SECTION 24.3. TERMINATION FOR SYSTEMS INTEGRATOR EVENT OF DEFAULT.

(A) MBTA Right. If a Systems Integrator Event of Default occurs, the MBTA may in its discretion and subject to the Lenders' rights pursuant to the Lenders' Remedies Agreement, terminate this Project Agreement by delivering written notice to the Systems Integrator specifying the Systems Integrator Event of Default.

(B) Termination Date. A termination for a Systems Integrator Event of Default shall be effective on the date notice of the termination is delivered by the MBTA, subject to the Lenders' rights pursuant to the Lenders' Remedies Agreement.

(C) Termination Amount. In the event of a termination for a Systems Integrator Event of Default, the MBTA shall pay the Systems Integrator the applicable Termination Amount in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

SECTION 24.4. TERMINATION FOR MBTA EVENT OF DEFAULT.

(A) Systems Integrator Right. If an MBTA Event of Default occurs, the Systems Integrator may in its discretion terminate this Project Agreement by delivering written notice to the MBTA specifying the MBTA Event of Default.

(B) Termination Date. A termination for an MBTA Event of Default shall be effective on the date written notice of the termination is delivered by the Systems Integrator.

(C) Termination Amount. In the event of a termination for an MBTA Event of Default, the MBTA shall pay the Systems Integrator the applicable Termination Amount in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

SECTION 24.5. TERMINATION BY COURT RULING.

(A) Termination Date. Any Termination by Court Ruling shall become effective and automatically terminate this Project Agreement upon issuance of a final, non-appealable court order by a court of competent jurisdiction.

(B) Termination Amount. In the event of a Termination by Court Ruling, the MBTA shall pay the Systems Integrator the applicable Termination Amount in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

SECTION 24.6. TERMINATION FOR EXTENDED EVENTS.

(A) Termination Right. If any:

(1) Relief Event; or

(2) Except in the event issued due to Systems Integrator Fault, issuance of any temporary restraining order, preliminary or permanent injunction or other form of interlocutory relief by a court of competent jurisdiction,

Causes one or both Parties to be unable to comply with its or their material obligations with respect to all or a material portion of the Project and such event and inability continues for a continuous period of at least 180 days (in each case, an "**Extended Event**"), then either Party may in its discretion, subject to Section 24.6(D), at any time thereafter during which such Extended Event is continuing, terminate this Project Agreement by written notice to the other Party.

(B) Termination Date. Subject to Section 24.6(D), any termination of this Project Agreement under this Section 24.6 shall be effective 30 days from the delivery of notice thereof.

(C) Termination Amount. In the event of a termination for an Extended Event pursuant to this Section, the MBTA shall pay the Systems Integrator the applicable Termination Amount in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

(D) MBTA Right to Reject. If the Systems Integrator delivers notice of termination to the MBTA pursuant to this Section 24.6, the MBTA may, in its discretion, reject such notice by written response to the Systems Integrator within 10 Business following receipt, in which case:

(1) If prior to the Full Service Commencement Date, such Extended Event shall be deemed to be a Compensation Event from the date on which termination of this Project Agreement would have otherwise been effective;

(2) If after the Full Service Commencement Date, the MBTA shall pay to the Systems Integrator beginning on the date on which termination of this Project Agreement would have otherwise been effective:

(a) Monthly Payments as if the Contract Services were being fully performed during such period pursuant to the requirements of this Project Agreement (net of:

(i) Actual avoidable costs of the Contract Services not being performed as a result of the occurrence of such Extended Event;

(ii) The amount the Systems Integrator is (or, pursuant to Section 17.1(F), should be) entitled to recover under any “business interruption” coverage under the Available Insurance as a direct result of the occurrence of such Extended Event; and

(iii) Any Deductions the MBTA is otherwise entitled to make pursuant to Appendix 8 (Payment Mechanism); plus

(b) Subject to Section 17.1(F), losses, costs and expenses reasonably incurred by the Systems Integrator as a direct result of any damage or delay (including demobilization and remobilization costs) resulting from such Extended Event;

(3) The Systems Integrator shall remain responsible for the continuation of the Contract Services to the extent not relieved of its obligations under Article 13 (Supervening Events) or as a result of the Extended Event; and

(4) The MBTA shall have the continued right to terminate this Project Agreement pursuant to this Section 24.6 following any rejection of the Systems Integrator’s notice of termination.

SECTION 24.7. TERMINATION FOR UNINSURABLE RISK.

(A) MBTA Right. Subject to Section 24.7(D), upon the determination of an Uninsurable Risk in accordance with Section 17.5(C), the MBTA may, in its discretion, terminate this Project Agreement by delivering written notice to the Systems Integrator referencing this Section 24.7 and indicating the Uninsurable Risk.

(B) Termination Date. Subject to Section 24.7(D), any termination of this Project Agreement by the MBTA under this Section 24.6 shall be effective 30 days from the delivery of notice thereof.

(C) Termination Amount. In the event of a termination for an Uninsurable Risk pursuant to this Section, the MBTA shall pay the Systems Integrator the applicable Termination Amount in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

(D) SI Election to Continue. If the MBTA delivers notice of termination to the MBTA pursuant to Section 24.7(A), the Systems Integrator may, subject to this Section 24.7(D), elect to continue this Project Agreement by delivering written notice of such election within 15 days following delivery of the MBTA's notice of termination, following which:

(1) The Systems Integrator shall, prior to the date on which termination of this Project Agreement would have otherwise been effective and as a condition to the continuation of this Project Agreement, deliver to the MBTA a cash deposit or an irrevocable on demand letter of credit from a Qualified Commercial Bank reasonably acceptable to the MBTA, in either case equal to the MBTA's reasonable estimate of the aggregate of:

(a) The maximum amount that the MBTA could be obligated to pay the Systems Integrator under Section 17.5(D)(3) as a result of the relevant risk being an Uninsurable Risk; and

(b) The maximum amount of MBTA losses that would have been compensable by insurance proceeds payable under the relevant policy of Required Insurance had the risk not become an Uninsurable Risk;

(2) The MBTA shall have the right to utilize such cash deposit or draw on such letter of credit to satisfy its payment obligations to the Systems Integrator under Section 17.5(D)(3) in respect of the occurrence of the relevant Uninsurable Risk, which shall not exceed the amount determined in accordance with Item (1)(a) of this Section 24.7(D);

(3) The MBTA shall have the right to retain such cash deposit or draw on and retain the proceeds of such letter of credit in the event of the occurrence of the relevant Uninsurable Risk in the amount determined in accordance with Item (1)(b) of this Section 24.7(D);

(4) Except as specifically modified by this Section 24.7(D), the provisions of Section 17.5(D) shall govern the continuation of this Project Agreement in respect of the Uninsurable Risk;

(5) The MBTA shall return such cash deposit or letter of credit (less any amount used, drawn or retained by the MBTA in accordance with this Section 24.7(D)) to the Systems Integrator promptly in the event that the relevant risk ceases to be an Uninsurable Risk and becomes insured under a policy of Required Insurance; and

(6) Subject to the foregoing, the MBTA's notice of termination shall have no further effect.

SECTION 24.8. FULL AND FINAL SETTLEMENT.

(A) Exclusivity of Remedy. Any Termination Amount irrevocably paid by the MBTA to the Systems Integrator pursuant to this Project Agreement shall be in full and final settlement of each Party's rights and claims against the other Party for, or in connection with, any breach or termination of this Project Agreement whether under contract, tort, restitution or otherwise, but without prejudice to:

(1) Any antecedent liability that arose prior to the Termination Date (but not from the termination itself) to the extent any such liability has not already been taken into account in determining the Termination Amount; and

(2) Any liability arising in respect of any breach after the Termination Date of any obligation under this Project Agreement that survives the Termination Date, to the extent any such liability has not already been taken into account in determining the Termination Amount.

(B) No Suit in Restitution Upon Payment of Termination Amount. In the event this Project Agreement is terminated for any reason, and the MBTA pays the applicable Termination Amount, the Systems Integrator covenants that it shall make no claim upon or otherwise pursue the MBTA or any MBTA Person for restitution based in any way upon the value of the Project to the MBTA or in the market exceeding the amount of the Termination Amount paid to the Systems Integrator. Without limiting the preceding sentence, the Systems Integrator acknowledges and agrees that it is the joint intention of the Parties that the Termination Amount is intended to operate as an unconditional and irrevocable discharge and release of any and every claim in restitution of which the Systems Integrator may hereafter otherwise possess in such circumstances of termination and payment of the applicable Termination Amount, including all restitutionary claims by the Systems Integrator based upon the value of the Project to the MBTA or in the market exceeding the Termination Amount (or any element of the calculation thereof) payable hereunder.

SECTION 24.9. ASSIGNMENTS AND TRANSFERS ON TERMINATION.

(A) Transfer Responsibilities. On or promptly after the Termination Date:

(1) If the Termination Date occurs prior to the Full Service Commencement Date, subject to Item (2) of this Section 24.9(A):

(a) The Systems Integrator shall preserve and protect the structures, equipment, materials and other property comprising the System as so far implemented; and

(b) Insofar as any transfer will be necessary to fully and effectively transfer property to the MBTA, the Systems Integrator shall transfer to, and there shall vest in, the MBTA, free from all financial encumbrances, such part of the System, including each System Element, that has been implemented on or has become affixed to the Locations and, if the MBTA so elects, the materials and equipment necessary for the completion of the Implementation Work, including all materials and equipment on or near the Locations, will remain available to the MBTA for the purposes of completing the Implementation Work, subject to payment by the MBTA of the relevant Project Contractor's reasonable charges;

- (2) Regardless of when the Termination Date occurs, the Systems Integrator shall transfer to, and there shall vest in, the MBTA, free from all financial encumbrances:
- (a) All spare parts required by the express terms of this Project Agreement to be maintained by the Systems Integrator and that are in the possession of any Systems Integrator Person;
 - (b) All Fare Cards that the Systems Integrator or any other Systems Integrator Person has in warehouse pursuant to Appendix 4.4 or that have been ordered or manufactured to satisfy the Systems Integrator's obligations under Appendix 4.4;
 - (c) All Devices and CN Equipment that the Systems Integrator or any other Systems Integrator Person has in storage for subsequent incorporation into the Project; and
 - (d) All proprietary or special maintenance tools, as described in Appendix 2.3, in the possession of any Systems Integrator Person;
- (3) If the Termination Date occurs during the period the Systems Integrator is required to store AFC 1.0 Equipment pursuant to Appendix 4.6, the Systems Integrator shall deliver all such AFC 1.0 Equipment as instructed by the MBTA pursuant to Appendix 4.6;
- (4) If the MBTA so elects, subject to the terms of the applicable Material Contract Direct Agreement, the Systems Integrator shall cause any or all of the Project Contracts (and any related contracts which govern the obligations between the Systems Integrator and the Project Contractor whose obligations have been assigned (such as a coordination or interface agreement)) to be novated or assigned to the MBTA;
- (5) If the MBTA so elects, cause the lease of the Model Office to be assigned to the MBTA;
- (6) The Systems Integrator shall, or will cause any Material Contract Party to, subject to the terms of the applicable Material Contract Direct Agreement, offer to sell to the MBTA at the fair market value and free from any security interest all or any part of the stocks of material and other assets, spare parts and other moveable property owned by the Systems Integrator or any Material Contract Party and reasonably required by the MBTA in connection with the operation of the System or the provision of the Contract Services;
- (7) Subject to Article 16 (Intellectual Property Rights), as applicable, the Systems Integrator shall deliver to the MBTA (to the extent not already delivered to the MBTA):
- (a) All existing Work Product, including designs, plans and other documents produced in connection with the Project;
 - (b) One complete set of existing drawings and other documentation showing all alterations made to the System since the commencement of operation of the System;
 - (c) One complete set of existing, up-to-date maintenance, operation and training manuals for the Project;

(d) Relevant information pertaining to any Legal Proceedings against the Systems Integrator by the Project Contractors, any Subcontractor or other third parties relating to the termination of the Implementation Work or the Operating Services (or any Subcontracts); and

(e) Copies of all Subcontracts, including all Subcontracts in respect of Utilities, together with a statement of:

(i) All items ordered and not yet delivered pursuant to each Subcontract;

(ii) The expected delivery date of all such items;

(iii) The total cost of each Subcontract and the terms of payment; and

(iv) The estimated cost of canceling each Subcontract;

(8) Without limiting any obligation under Article 16 (Intellectual Property Rights), the Systems Integrator shall use all reasonable efforts to ensure that the benefit of existing Project Intellectual Property and all warranties in respect of mechanical and electrical equipment used or made available by the Systems Integrator under this Project Agreement and included in the Project but not previously assigned or licensed to the MBTA are assigned, licensed or otherwise transferred to the MBTA;

(9) To the extent permitted by Applicable Law, the Systems Integrator shall assign to the MBTA all Governmental Approvals;

(10) The Systems Integrator shall deliver to the MBTA all books, records and files required to be kept by the Systems Integrator hereunder (the Systems Integrator having the right to retain copies thereof) unless such documents are:

(a) Required by Applicable Law to be retained by the Systems Integrator or a Project Contractor or Subcontractor, in which case complete copies will be delivered to the MBTA; or

(b) Privileged under Applicable Law from production pending resolution of any outstanding dispute, in which case such records will be delivered forthwith upon resolution of such dispute, provided that any records that are necessary for the performance of the Contract Services will be delivered to the MBTA no later than the Termination Date;

(11) The Systems Integrator shall give written notice of termination, effective as of the Termination Date, promptly under each policy of Required Insurance (with a copy of each such notice to the MBTA), but permit the MBTA to continue such policies thereafter at its own expense, if possible; and

(12) The Systems Integrator shall take such other actions, and execute such other documents as may be necessary to effectuate and confirm the foregoing matters, or as may be otherwise necessary or desirable to minimize the MBTA's costs, and take no action which shall increase any amount payable by the MBTA under this Project Agreement.

(B) No Additional Compensation. The Systems Integrator shall ensure, subject to the security interest of the Lenders, that provision is made in all applicable contracts to ensure that the MBTA will be in a position to exercise its rights, and the Systems Integrator shall be in a position to comply with its obligations, under this Section without additional payment or compensation to any person.

SECTION 24.10. TRANSITIONAL OBLIGATIONS.

The Systems Integrator shall, in connection with the expiration or any termination of this Project Agreement:

- (1) Stop the Contract Services on the Termination Date;
- (2) On the Termination Date and without limiting any obligation under Section 24.9, deliver or cause to be delivered to the MBTA:
 - (a) all keys, access codes or other devices required to operate the System and perform the Contract Services; and
 - (b) any Intellectual Property required to be delivered by the Systems Integrator pursuant to Article 16 (Intellectual Property Rights);
- (3) As soon as practicable after the Termination Date, vacate, and cause all Systems Integrator Persons to vacate, the Locations, and leave the Locations in a safe, clean and orderly condition;
- (4) On request by the MBTA and subject to payment by the MBTA of the Systems Integrator's reasonable costs, for a period not to exceed 90 days after the Termination Date, cooperate fully with the MBTA and any successor providing to the MBTA services in the nature of any of the Contract Services or any part of the Contract Services, in order to achieve a smooth transfer of the manner in which the MBTA obtains services in the nature of the Contract Services and to avoid or mitigate in so far as reasonably practicable any inconvenience or any risk to the health, safety and security of the employees of the MBTA and members of the public;
- (5) As soon as practicable following the Termination Date, remove from the Locations all property of the Systems Integrator or any other Systems Integrator Person that is not acquired by the MBTA pursuant to Section 24.9 or that does not otherwise belong to the MBTA, and if it has not done so within 60 days after any notice from the MBTA requiring it to do so, the MBTA may (without being responsible for any loss, damage, costs or expenses) remove and sell any such property and will hold any proceeds less all costs incurred by the MBTA in connection therewith, to the credit of any amount owing to the Systems Integrator and otherwise to the credit and direction of the Systems Integrator; and
- (6) Comply with all Handback Requirements; provided that, the Systems Integrator's obligation to comply with the Handback Requirements shall be applicable only on the Expiration Date and not on any earlier Termination Date.

SECTION 24.11. SYSTEMS INTEGRATOR TO COOPERATE.

If the MBTA wishes to conduct a competition prior to the Termination Date with a view to entering into an agreement for the provision of services (which may or may not be the same as, or similar to, the Contract Services or any of them) following the Termination Date, the Systems Integrator

shall prior to the Termination Date co-operate with the MBTA fully in such competition process, including by:

- (1) Subject to Article 16 (Intellectual Property Rights) and Section 25.8, providing any information in the Systems Integrator's control or possession which the MBTA may reasonably require to conduct such competition; and
- (2) Assisting the MBTA by providing any participants in such competition process with access to the Locations and System, provided such access does not affect the ability of the Systems Integrator to perform the Contract Services in accordance with this Project Agreement.

The Systems Integrator shall be entitled to reimbursement for all reasonable out of pocket expenses and internal costs incurred in connection with the foregoing services.

ARTICLE 25

MISCELLANEOUS PROVISIONS

SECTION 25.1. RELATIONSHIP OF THE PARTIES.

The Systems Integrator is an independent contractor of the MBTA and the relationship between the parties shall be limited to performance of this Project Agreement in accordance with its terms. Neither Party shall have any responsibility with respect to the services to be provided or contractual benefits assumed by the other Party. Nothing in this Project Agreement shall be deemed to constitute either Party a partner, agent or legal representative of the other Party. No liability or benefits, such as workers compensation, pension rights or liabilities, or other provisions or liabilities arising out of or related to a contract for hire or employer/employee relationship shall arise or accrue to any Party's agent or employee as a result of this Project Agreement or the performance thereof.

SECTION 25.2. GENERAL DUTY TO MITIGATE.

(A) Mitigation by the Systems Integrator. In all cases where the Systems Integrator is entitled to receive any relief from the MBTA or exercise any rights, including the right to receive any payments, costs, damages or extensions of time, whether on account of Supervening Events or otherwise, the Systems Integrator shall use all reasonable efforts to mitigate such amount required to be paid by the MBTA to the Systems Integrator under this Project Agreement, or the length of the extension of time. Such mitigation measures shall include, as applicable, using all reasonable efforts to coordinate with third parties, including Utility owners and Governmental Bodies, to effectuate an appropriate response and compliance with all procedures and other requirements necessary to obtain any available waiver or exemption from Taxes that would otherwise be borne directly or indirectly by the MBTA. Upon request from the MBTA, the Systems Integrator shall promptly submit a detailed description, supported by all such documentation as the MBTA may reasonably require, of the measures and steps taken by the Systems Integrator to mitigate and meet its obligations under this subsection.

(B) Mitigation by the MBTA. In all cases where the MBTA is entitled to receive from the Systems Integrator any compensation, costs or damages, but not in any other cases, the MBTA shall use all reasonable efforts to mitigate such amount required to be paid by the Systems Integrator to the MBTA under this Project Agreement, provided that such obligation shall not require the MBTA to:

- (1) Take any action which is contrary to the public interest, as determined by the MBTA, acting reasonably;
- (2) Undertake any mitigation measures that might be available arising out of its status as a Governmental Body, but which measure would not normally be available to a private commercial party; or
- (3) Alter the amount of Deductions it is entitled to make in accordance with Appendix 8 (Payment Mechanism).

The MBTA shall have no obligation to mitigate, implied or otherwise, except as set forth in this subsection or otherwise as expressly provided in this Project Agreement. Upon request by the Systems Integrator, the MBTA shall promptly submit a detailed description, supported by all such documentation as the Systems Integrator may reasonably require, of the measures and steps taken by the MBTA to mitigate and meet its obligations under this subsection.

SECTION 25.3. PROJECT AGREEMENT ADMINISTRATION.

(A) Designation of Authorized Representatives. The MBTA and the Systems Integrator shall each designate in writing to the other Party an individual or individuals who shall be authorized to make decisions and bind the Parties, or to obtain approval from their respective principals which shall bind such principal, on matters relating to this Project Agreement. A Party may change such designations by written notice to the other Party in accordance with Section 25.12.

(B) Authority of MBTA Representative. The Systems Integrator understands and agrees that the MBTA Representative has only limited authority with respect to the implementation of this Project Agreement, and, except as expressly authorized by the MBTA in accordance with the Applicable Law that generally governs its affairs, cannot bind the MBTA with respect to any Change Order or other Amendment. Within such limitations, the Systems Integrator shall be entitled to rely on the written directions of the MBTA Representative. The MBTA Representative shall have the right at any time to issue the Systems Integrator a written request for information relating to this Project Agreement. Any written request designated as a “priority request” shall be responded to by the Systems Integrator within three Business Days.

(C) Administrative Communications. The Parties recognize that a variety of contract administrative matters will routinely arise throughout the Term. These matters will by their nature involve requests, notices, questions, assertions, responses, objections, reports, claims, and other communications made personally, in meetings, by phone, by mail and by electronic and computer communications. The purpose of this Section is to set forth a process by which the resolution of these matters, once resolution is reached, can be formally reflected in the common records of the Parties so as to permit the orderly and effective administration of this Project Agreement.

(D) Contract Administration Memoranda. The principal formal tool for the administration of routine matters arising under this Project Agreement between the Parties which do not require an Amendment shall be a “**Contract Administration Memorandum.**” A Contract Administration Memorandum shall be prepared, once all preliminary communications have been concluded, to evidence the resolution reached by the MBTA and the Systems Integrator as to matters of interpretation and application arising during the course of the performance of their obligations hereunder. Such matters may include, for example:

- (1) Issues as to the meaning, interpretation or application of this Project Agreement in particular circumstances or conditions;
- (2) Calculations required to be made;
- (3) Notices, waivers, releases, satisfactions, confirmations, further assurances, consents and approvals given hereunder; and
- (4) Other similar routine contract administration matters.

(E) Procedure. Either Party may request the execution of a Contract Administration Memorandum. When resolution of the matter is reached, a Contract Administration Memorandum shall be prepared by or at the direction of the MBTA reflecting the resolution. Contract Administration Memoranda shall be serially numbered, dated, signed by the MBTA Representative and the Systems Integrator Representative. The MBTA and the Systems Integrator each shall maintain a parallel, identical file of all Contract Administration Memoranda, separate and distinct from the Amendments and all other documents relating to the administration and performance of this Project Agreement.

(F) Effect. Executed Contract Administration Memoranda shall serve to guide the ongoing interpretation and application of the terms and conditions of this Project Agreement.

SECTION 25.4. AMENDMENTS.

Notwithstanding the provisions of Section 25.3, no material change, alteration, revision or modification of the terms and conditions of this Project Agreement shall be made except through a written amendment to this Project Agreement (an “**Amendment**”) duly authorized, approved or ratified by the MBTA in accordance with Applicable Law and duly authorized by the Systems Integrator. Amendments shall be dated and signed by representatives of the Parties with all requisite authority to bind the Parties in connection with any such Amendment. The Parties acknowledge and agree that a Change Order is an Amendment.

SECTION 25.5. MBTA APPROVALS AND CONSENTS.

When this Project Agreement requires any approval or consent by the MBTA to a Systems Integrator submittal, request or report, the approval or consent shall, within the limits of the authority of Section 25.3(A), be given by the MBTA Representative in writing and such writing shall be conclusive evidence of such approval or consent, subject only to compliance by the MBTA with the Applicable Law that generally governs its affairs. Unless expressly stated otherwise in this Project Agreement, and except for:

- (1) Approvals provided for in Appendix 7 (MBTA Review Procedures), which shall be governed by the terms of such Appendix; and
- (2) Requests, reports and submittals made by the Systems Integrator that do not, by their terms or the terms of this Project Agreement, require a response or action,

If the MBTA does not find a request, report or submittal acceptable, it shall provide written response to the Systems Integrator describing its objections and the reasons therefor within 30 days of the MBTA’s receipt thereof. If no response is received, the request, report or submittal shall be deemed rejected unless the MBTA’s approval or consent may not be unreasonably delayed by the express terms hereof, in which case, the request, report or submittal shall be deemed accepted, subject to Section 10 of Appendix 7 (MBTA Review Procedures).

SECTION 25.6. WAIVERS.

Any waiver of, or consent to depart from, the requirements of any provision of this Project Agreement shall be approved in the discretion of the Party giving it and shall be effective only if it is in writing by such Party, and only in the specific instance, for the specific time, subject to the specific conditions and for the specific purpose for which it has been given.

SECTION 25.7. ACTIONS OF THE MBTA ENTITIES IN THEIR GOVERNMENTAL CAPACITY.

Nothing in this Project Agreement shall be interpreted as limiting the rights and obligations of any MBTA Entity (or any department or agency thereof) under Applicable Law in its governmental capacity (including police power actions to protect health, safety and welfare), or as limiting the right of the Systems Integrator to bring any action against any MBTA Entity (or any department or agency thereof), not based on this Project Agreement, arising out of any act or omission of such MBTA Entity (or any department or agency thereof) in their governmental capacity.

SECTION 25.8. CONFIDENTIALITY.

(A) **Confidential Information.** Subject to subsection (B) of this Section and without limiting any Technical Requirement in respect of Data, each Party will hold in confidence any Confidential Information received from the other Party, except that this Section will not restrict either Party from disclosing or granting access to such information to its professional advisers and consultants, to the extent necessary, to enable it to perform (or to cause to be performed) or to enforce its rights or obligations under this Project Agreement, and provided further that the Systems Integrator may, subject to obtaining confidentiality restrictions similar to those set forth in this Project Agreement:

(1) Provide to the Lenders and other potential lenders, equity providers, underwriters, arrangers, investment dealers, monoline insurers and their respective advisors such documents and other information as are reasonably required by them in connection with raising financing for the Project or complying with the terms of the Financing Documents; and

(2) Provide to a Project Contractor and its advisors, or provide or cause to be provided to other third parties, Confidential Information which is necessary to enable the Systems Integrator to perform (or to cause to be performed) its obligations under this Project Agreement.

(B) **Exceptions.** Subject to any restrictions on the Confidential Information which are imposed by a third party that may own any Confidential Information and without limiting any Technical Requirement in respect of Data, the obligation to maintain the confidentiality of the Confidential Information does not apply to Confidential Information:

(1) Which is or comes into the public domain otherwise than through any disclosure prohibited by this Project Agreement;

(2) To the extent any person is required to disclose such Confidential Information by Applicable Law or, in the case of the MBTA, by generally applicable MBTA information disclosure policies;

(3) To the extent consistent with MBTA's policy concerning the MBTA's Confidential Information, the details of which have been provided to the Systems Integrator in writing prior to the disclosure;

(4) Any Governmental Body which requires the information in relation to the Project; or

(5) That the MBTA may be entitled to receive from the Systems Integrator pursuant to this Project Agreement for the operation, maintenance or improvement of the Project in the event of, or following, termination of this Project Agreement.

(C) **Security Plan.** Without limiting any other requirement hereunder, if requested by the MBTA, the Systems Integrator shall prepare a security plan to assure that Confidential Information obtained from the MBTA or as a consequence of the performance of the Contract Services is not used for any unauthorized purpose or disclosed to unauthorized persons. The Systems Integrator shall advise the MBTA of any request for disclosure of information or of any actual or potential disclosure of information.

(D) **Public Communications of Confidential Information.** Unless expressly provided in this Project Agreement or otherwise required by Applicable Law (but only to that extent), neither Party will make or permit to be made any public announcement or disclosure whether for publication in the

press, radio, television or any other medium of any Confidential Information, without the written consent of the other Party (which will not be unreasonably withheld or delayed).

(E) Equitable Relief. Without prejudice to any other rights and remedies that the other Party may have, each of the Parties agrees that damages may not be an adequate remedy for a breach of subsection (A) of this Section, and that the other Party will, in such case, be entitled to the remedies of injunction, specific performance or other equitable relief for any threatened or actual breach of subsection (A) of this Section.

SECTION 25.9. PERSONAL INFORMATION.

(A) General. The Systems Integrator shall, and shall require all Systems Integrator Persons to, only collect, hold, process, use, store and disclose Personal Information:

- (1) With the prior consent of the MBTA;
- (2) To the extent necessary to perform the Systems Integrator's obligations under this Project Agreement and in accordance with all Technical Requirements; and
- (3) In accordance with Applicable Law, including:
 - (a) All Privacy Laws; and
 - (b) The Public Records Act as if the provisions of such Public Records Act applied directly to the Systems Integrator, the Project Contractors and Subcontractors.

Without limiting any Technical Requirement, the Systems Integrator shall allow the MBTA on reasonable notice to inspect the measures of the Systems Integrator and its Project Contractors and Subcontractors to protect Personal Information.

(B) Specific Commonwealth Requirements. The Systems Integrator certifies that all steps will be taken to ensure the security and confidentiality of all Commonwealth data for which the Systems Integrator becomes a holder, either as part of performance or inadvertently during performance, with special attention to restricting access, use and disbursement of personal data and information under G.L. c. 93H and c. 66A. Without limiting any other requirement hereunder, the Systems Integrator shall comply with G.L. c. 93I for the proper disposal of all paper and electronic media, backups or systems containing personal data and information, and shall ensure that any personal data or information transmitted electronically or through a portable device be properly encrypted in accordance with the Contract Standards.

(C) Security Breach. Without limiting any requirement hereunder, in the event of any unauthorized access, destruction, use, modification, disclosure or loss of any Personal Information (collectively referred to as the "unauthorized use") the Systems Integrator shall:

- (1) Immediately notify the MBTA if the Systems Integrator becomes aware of the unauthorized use;
- (2) Provide full cooperation and access to information necessary for the MBTA to determine the scope of the unauthorized use; and

(3) Provide full cooperation and access to information necessary for the MBTA and the Systems Integrator to fulfill any notification requirements.

Breach of these terms may be regarded as a material breach of this Project Agreement, such that the MBTA may exercise any and all contractual rights and remedies hereunder. In addition, the Systems Integrator may be subject to applicable statutory or regulatory penalties, including those imposed pursuant to G.L. c. 93H and under G.L. c. 214, s. 3B for violations under M.G.L. c. 66A.

SECTION 25.10. COMPLIANCE WITH MATERIAL AGREEMENTS.

The Systems Integrator shall comply with its obligations under agreements of the Systems Integrator which are material to the performance of its obligations under this Project Agreement. The MBTA shall comply with its obligations under agreements of the MBTA which are material to the performance of its obligations hereunder.

SECTION 25.11. BINDING EFFECT.

This Project Agreement shall inure to the benefit of and shall be binding upon the MBTA and the Systems Integrator and any assignee acquiring an interest hereunder consistent with Article 15 (Assignment and Change in Control).

SECTION 25.12. NOTICES.

(A) Procedure. All notices, consents, approvals or written communications given pursuant to the terms of this Project Agreement will be in writing and will be considered to have been sufficiently given if delivered by hand or transmitted by facsimile or electronic transmission to the address, facsimile number or electronic mail address of each Party set forth below in this Section, or to such other address, facsimile number or electronic mail address as either Party may, from time to time, designate in the manner set forth above. Any such notice or communication will be considered to have been received:

(1) If delivered by hand during business hours (and in any event, at or before 5:00 pm local time in the place of receipt) on a Business Day, upon receipt by a responsible representative of the receiver, and if not delivered during business hours, upon the commencement of business hours on the next Business Day;

(2) If sent by facsimile transmission during business hours (and in any event, at or before 5:00 pm local time in the place of receipt) on a Business Day, upon receipt, and if not delivered during business hours, upon the commencement of business hours on the next Business Day following confirmation of the transmission; and

(3) If delivered by electronic mail during business hours (and in any event, at or before 5:00 pm local time in the place of receipt) on a Business Day, upon receipt, and if not delivered during business hours, upon the commencement of business hours on the next Business Day.

(B) MBTA Notice Address. Notices required to be given to the MBTA shall be addressed as follows:

with a copy to:

If notice is related to audit requests or alleged defaults or violations by the MBTA, with a copy also to:

If notice is related to the performance of the DB Installation Work, with a copy also to:

(C) Systems Integrator Notice Address. Notices required to be given to the Systems Integrator shall be addressed as follows:

with a copy to:

SECTION 25.13. NOTICE OF LITIGATION.

In the event the Systems Integrator or the MBTA receives notice of or undertakes the defense or the prosecution of any Legal Proceedings, claims, or investigations in connection with the Project, the Party receiving such notice or undertaking such defense or prosecution shall give the other Party timely notice of such proceedings and shall inform the other Party in advance of all hearings regarding such proceedings. For purposes of this Section only, "timely notice" shall be deemed given if the receiving Party has a reasonable opportunity to provide objections or comments or to proffer to assume the defense or prosecution of the matter in question, given the deadlines for response established by the relevant rules of procedure.

SECTION 25.14. FURTHER ASSURANCES.

The Parties will do, execute and deliver, or will cause to be done, executed and delivered, all such further acts, documents (including certificates, declarations, affidavits, reports and opinions) and things as the other may reasonably request for the purpose of giving effect to this Project Agreement or for the purpose of establishing compliance with the representations, warranties and obligations of this Project Agreement.

SECTION 25.15. SYSTEMS INTEGRATOR CERTIFICATIONS.

(A) General. The Systems Integrator makes all certifications required under this Project Agreement under the pains and penalties of perjury, and agrees to provide any required documentation upon request to support compliance. All legal requirements governing contractors doing business in the Commonwealth are incorporated by reference herein.

(B) Qualifications. The Systems Integrator certifies it is qualified and shall at all times remain qualified to perform this Project Agreement, and that performance shall be timely (as established by the timeline requirements of this Project Agreement) and meet or exceed industry standards for the performance required, including obtaining requisite licenses, registrations, permits, resources for performance, and sufficient professional liability and other appropriate insurance to cover the performance of this Project Agreement. The Systems Integrator certifies that it is listed under the Secretary of the Commonwealth's website as licensed to do business in the Commonwealth, as required by law.

(C) Business Ethics and Fraud, Waste and Abuse Prevention. The Systems Integrator certifies that performance under this Project Agreement, in addition to meeting the terms of this Project Agreement, will be made using ethical business standards and good stewardship of taxpayer and other public funding and resources to prevent fraud, waste and abuse. Systems Integrator records related to any breach or allegation of fraud, waste or abuse may not be denied, and the Systems Integrator cannot claim confidentiality or trade secret protections solely for viewing but not retaining such documents.

(D) Collusion. The Systems Integrator certifies that this Project Agreement has been offered in good faith and without collusion, fraud or unfair trade practices with any other person, that any actions to avoid or frustrate fair and open competition are prohibited by law, and shall be grounds for termination of this Project Agreement.

(E) Debarment. The Systems Integrator certifies that neither it nor any Project Contractor or Subcontractor is currently debarred or suspended by the federal or Commonwealth government under any law or regulation.

(F) Tax Law Compliance. The Systems Integrator certifies compliance with Federal tax laws; compliance with Commonwealth tax laws, including G.L. c. 62C, G.L. c. 62C, s. 49A; compliance with all Commonwealth laws regarding reporting of employees and contractors, withholding and remitting of tax withholdings and child support; and compliance with TIR 05-11 and all other applicable TIRs. The Systems Integrator certifies that it is in good standing with respect to all Commonwealth taxes and returns due.

(G) Bankruptcy, Judgments, Potential Structural Changes, Pending Legal Matters and Conflicts. The Systems Integrator certifies it has not been in bankruptcy or receivership within the last three calendar years, and the Systems Integrator certifies that it will immediately notify the MBTA in writing at least 45 days prior to filing for bankruptcy or receivership, any potential structural change in its organization, or if there is any risk to the solvency of the Systems Integrator that may impact the Systems Integrator's ability to timely fulfill the terms of this Project Agreement. The Systems Integrator shall affirmatively disclose in writing to the MBTA Representative the details of any judgment, criminal conviction, investigation or litigation pending against the Systems Integrator or any of its officers, directors, employees, agents, or subcontractors, including any actual or potential conflicts of interest of which the Systems Integrator has knowledge, or learns of during the Term.

(H) PCI Compliance. The Systems Integrator certifies that each Systems Integrator Person having access to User credit card or banking information in the performance of the Contract Services is compliant with applicable PCI Security Standards Council (PCI-SSC) standards, as described in Appendix 3.1. The Systems Integrator shall provide confirmation of such compliance upon request by the MBTA at any time during the Term.

(I) Corporate and Business Filings and Reports. The Systems Integrator certifies compliance with any certification, filing, reporting and service of process requirements related to its conduct of business in the Commonwealth and with its incorporating state (or foreign entity).

(J) Employment Laws. The Systems Integrator certifies compliance with applicable Commonwealth and federal employment laws and regulations, including minimum wages and prevailing wage programs and payments; unemployment insurance and contributions; workers' compensation and insurance, child labor laws, AGO fair labor practices; G.L. c. 149 (Labor and Industries); G.L. c. 150A (Labor Relations); G.L. c. 151 and 455 CMR 2.00 (Minimum Fair Wages); G.L. c. 151A (Employment and Training); G.L. c. 151B (Unlawful Discrimination); G.L. c. 151E (Business Discrimination); G.L. c. 152 (Workers' Compensation); G.L. c.153 (Liability for Injuries); 29 USC c. 8 (Federal Fair Labor Standards); 29 USC c. 28 and the Federal Family and Medical Leave Act.

(K) Laws Prohibiting Discrimination. The Systems Integrator certifies compliance with all Commonwealth and federal laws and regulations, including the Federal Equal Employment Opportunity Laws, the Americans with Disabilities Act, and the Massachusetts Disability-Based Non-Discrimination Standards For Executive Branch Entities, and related standards and guidance authorized under Massachusetts Executive Order or any disability-based protection arising from state or federal law or precedent.

(L) Northern Ireland Certification. Pursuant to G.L. c. 7 s. 22C for state agencies, state authorities, the House of Representatives or the state Senate, by signing this Project Agreement, the Systems Integrator certifies either that it does not employ ten or more employees in an office or other facility in Northern Ireland or, if the Systems Integrator employs ten or more employees in an office or other facility located in Northern Ireland, that:

- (1) It does not discriminate in employment, compensation, or the terms, conditions and privileges of employment on account of religious or political belief;
- (2) It promotes religious tolerance within the work place, and the eradication of any manifestations of religious and other illegal discrimination; and
- (3) It is not engaged in the manufacture, distribution or sale of firearms, munitions, including rubber or plastic bullets, tear gas, armored vehicles or military aircraft for use or deployment in any activity in Northern Ireland.

(M) Executive Orders. The Systems Integrator certifies compliance with all applicable Commonwealth Executive Orders, including compliance with the following:

- (1) Pursuant to Executive Order 481, the Systems Integrator shall not knowingly use undocumented workers in connection with the performance of this Project Agreement; shall pursuant to federal requirements, verify the immigration status of workers assigned to this Project Agreement without engaging in unlawful discrimination; and shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker.

(2) Pursuant to Executive Order 130, the Systems Integrator warrants, represents and agrees that during the Term, neither it nor any affiliated company, as hereafter defined, participates in or cooperates with an international boycott (See IRC § 999(b)(3)- (4), and IRS Audit Guidelines Boycotts) or engages in conduct declared to be unlawful by G.L. c. 151E, s. 2. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the Systems Integrator or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interests of the Systems Integrator, or which directly or indirectly owns at least 51% of the ownership interests of the Systems Integrator.

(3) Pursuant to Executive Order 346, the Systems Integrator shall not hire at any time during the Term for any position in the Systems Integrator's company, any state management employee who is, was, or will be involved in the preparation of the RFP, the negotiations leading to the awarding of this Project Agreement, the decision to award this Project Agreement, or the supervision or oversight of performance under this Project Agreement.

(4) Pursuant to Executive Order 444, each person applying for employment (including contract work) within the Executive Branch under the Governor must disclose in writing the names of all immediate family related to immediate family by marriage who serve as employees or elected officials of the Commonwealth. All disclosures made by applicants hired by the Executive Branch under the Governor shall be made available for public inspection to the extent permissible by law by the official with whom such disclosure has been filed.

(5) Pursuant to Executive Order 504, the Systems Integrator certifies that (x) it has read the Commonwealth of Massachusetts Executive Order 504 and agrees to protect any and all personal information (as defined in Executive Order 504) and (y) has reviewed all of the Commonwealth Information Technology Division's Security Policies. In connection with its performance under this Project Agreement, the Systems Integrator shall, without limiting anything under Section 25.9:

(a) Obtain a copy, review, and comply with the MBTA's Information Security Program (ISP) and any pertinent security guidelines, standards, and policies;

(b) Comply with all of the Commonwealth of Massachusetts Information Technology Division's Security Policies;

(c) Communicate and enforce the MBTA's ISP and such Security Policies against all employees (whether such employees are direct or contracted) and subcontractors;

(d) Implement and maintain any other reasonable appropriate security procedures and practices necessary to protect personal information to which the Systems Integrator is given access by the MBTA from the unauthorized access, destruction, use, modification, disclosure or loss; and

(e) Be responsible for the full or partial breach of any of these terms by its employees (whether such employees are direct or contracted) or subcontractors during or after the Term, and any breach of these terms may be regarded as a material breach of this Project Agreement.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the Parties have caused this Project Agreement to be executed by their duly authorized representatives on the day and year first above written.

[SIGNATURE PAGE TO BE DEVELOPED.]

APPENDIX 1

DEFINITIONS

As used in this Project Agreement, the following capitalized terms have the meanings set forth below.

“Accessible” or **“Accessibility”** means compliance with Applicable Accessibility Law or the Key Accessibility Criteria, as determined pursuant to Appendix 2.9.

“Accessible Gate” means a Variant of a Gate which meets additional Accessibility requirements, as more particularly described in Appendix 2.3 and 2.9.

“Account” means a collection of Data, information, instructions, permissions and any Account Balance associated with a particular User or Group on the System that establishes a relationship between the User or Group and the System, including any Registered Account, Unregistered Account, Group Account, or other Account types created on, by, or through the System.

“Account Balance” means the Value and Products in an Account that are available for use in accordance with Configuration and Fare Policy.

“Account Data Timeliness Customer Service Standards” means the standards identified as such in Appendix 3.8.

“Account Data Timeliness Revenue Protection Standards” means those standards identified as such in Appendix 3.8.

“Account Data Timeliness Standards” means the Account Data Timeliness Customer Service Standards and the Account Data Timeliness Revenue Protection Standards.

“Account Management Interfaces” means System Elements with User Interfaces which the System must provide to allow for management of Accounts, including the System Website, IVR, Administrator Interface, Fare Vending Machines and, if applicable, the Fare Card Mobile Application.

“Account Verification” means a special type of Authorization to determine the status of an Account, i.e., that the Account is in good standing.

“ACH TEL” or **“ACH Telephone-Initiated”** means consumer debit transactions permitted by NACHA Operating Rules when the System obtains the User’s authorization for the debit entry orally via telephone call.

“ACH WEB” or **“ACH Internet-Initiated/Mobile Entries”** means consumer debit transactions permitted by NACHA Operating Rules which are used for the origination of debit entries (either recurring or single entry) to a User’s account pursuant to an authorization that is obtained from the User via the internet or a wireless network, excluding oral authorizations via these channels, in accordance with NACHA Operating Rules.

“Acquirer” means a Payment Service Provider that:

- (1) Allows the SI and the MBTA to accept and process Payment Card payments;

(2) Clears transactions from Payment Card-issuing banks between the time they are Authorized and then deposited into the bank account(s) described in Section 1.3.2 of Appendix 4.7; and

(3) Monitors compliance with the Payment Industry Standards applicable to a merchant.

“**Act**” means M.G.L. c. 161A et seq.

“**Activate**” or “**Activation**” means a process within the System that causes a Fare Card to become Activated.

“**Activated**” or “**Active**” means the state of a Fare Card in which the Fare Card is eligible to be used, subject to Configuration, at a Device.

“**Actual Benchmarked Insurance Cost**” means, in respect of any Insurance Review Period, the aggregate of the insurance premiums reasonably incurred by the Systems Integrator to maintain the Benchmarked Insurance during the Insurance Review Period but excluding any insurance premium tax or broker's fees and commissions and not including any amounts paid by the Systems Integrator or set-off by the MBTA in accordance with Section 17.5(D) or Section 17.6(B).

“**Administrative Point of Sales**” or “**APOS**” means the commercial point of sale terminals at locations other than the Retail Reload Locations, as further described in Appendix 2.15.

“**Administrator**” means a Profile that can be used to view and manage designated Accounts, as set forth in Appendix 3.8.

“**Administrator Interface**” means the web-based tool, making up part of the Customer Support Software, by which Administrators are able to perform Account management functions, as set forth in Appendix 3.8.

“**AFC 1.0 Equipment**” means any equipment installed as part of the Existing System.

“**AFC 1.0 FVM**” means any fare vending machine installed as part of the Existing System.

“**AFC 1.0 Gate**” means AFC 1.0 Equipment installed as part of the Existing System and referred to in the Reference Documents as the “Fare Gate” or the “TGH”.

“**AFC 1.0 Media**” means any fare media, including magnetic stripe media and contactless/smartcard media, associated with the Existing System.

“**AFC 2.0 Brand Style & Use Guide**” is a document providing guidance on the use of the AFC 2.0 brand for use in the visual design of User Interfaces, which will be developed by the MBTA and provided to the Systems Integrator.

“**Affected Party**” has the meaning specified in the definition of Force Majeure Event.

“**Affiliate**” means:

(1) Any Equity Member;

(2) Any person who directly or indirectly through one or more intermediaries controls or is controlled by or is under common control with the Systems Integrator or any Equity Member; and

(3) Any person for which twenty percent (20%) or more of the equity interest in such Person is held directly or indirectly, beneficially or of record by (a) the Systems Integrator, (b) any Equity Member or (c) any Affiliate of the Systems Integrator under clause (2) of this definition.

For purposes of this definition the term “control” means the possession, directly or indirectly of the power to cause the direction of the management of a person, whether through voting rights or securities, by contract, family relationship or otherwise.

“**Aggregate Data**” means Analytics or other information or Data (a) derived from or reliant upon Data (including PII), or (b) generated in whole or in part from Data (including via the System Website through cookies, tags or other means). The term “Aggregate Data” includes user profiles or other information that is capable of use for purposes of behavioral advertising, advertising targeted to specific Users or other advertising.

“**Allowable AP Transaction Fees**” means only:

(1) The per unit wholesale costs associated with the purchase of smartcards for use to meet Fare Card requirements, on an arms’ length basis;

(2) The fees charged by the Acquirer for accepting payments through the Acquirer’s card processing environment;

(3) Bank transaction fees in respect of ACH, check, and wire transfer and corresponding returns;

(4) The transaction fees and commissions charged for access to a third party network enabling sales at Retail Reload Locations;

(5) The fees associated with the utilization of Payment Card Data tokenization service(s), on an arms’ length basis; and

(6) The fees associated with provisioning and maintaining the Fare Card in iOS and Android mobile wallets.

“**Allowable AP Transaction Rate**” means the corresponding rate shown in Table 7 of Appendix 8 (Payment Mechanism) which is used in calculating the portion of AP Transactions related to Fare Revenue for a Month, or a rate shown in Table 8 of Appendix 8 (Payment Mechanism) which is used in calculating the portion of AP Transactions related to Transaction Units occurring in a Month.

“**Alternate**” means a person authorized by a Registered User to receive communications and/or notifications by the System, other than or in addition to the Registered User.

“**Alternate Paths**” means alternate paths of travel in a Trip that have the same sequence of Taps due to in-Station interchanges.

“**Amendment**” has the meaning set forth in Section 25.4.

“**Analytics**” means the results of an analysis or monitoring of a data set, using statistical, automated, manual or other methods, including data mining methods.

“**Annual Review**” means the annual review of the Operating Services conducted by the MBTA and the Systems Integrator in accordance with Section 5 of Appendix 8 (Payment Mechanism).

“**Anti-Passback Control**” means controls that prevent a User from using a Credential for more than one accepted Tap at a single Station or Vehicle.

“**AP O&M**” or “**APO**” means the component of the Availability Payment related to the Systems Integrator’s obligations hereunder in respect of performing the Operating Services, the amount of which is shown for each Month of each Fiscal Year in Table 6 of Appendix 8 (Payment Mechanism).

“**AP Transaction Change**” has the meaning set forth in Section 6.4.5(a) of Appendix 8.

“**AP Transaction Reset**” has the meaning set forth in Section 6.4.6 of Appendix 8.

“**AP Transactions**” or “**APT**” means the component of the Availability Payment related to the Total AP Transaction Rates applied to Fare Revenue and Transaction Units, based on calculation so named and described on Attachment 1 (Monthly Payment calculation worksheet) of Appendix 8 (Payment Mechanism).

“**APC**” or “**AP Capital**” means the component of the Availability Payment related to the Systems Integrator’s obligations hereunder in respect of financing the Project and performing the Implementation Work, the amount of which is [•] for each Month of each Fiscal Year¹ of the Initial Term.

“**APC Milestone Date**” means each of the Scheduled Transition Period Completion Date, the Scheduled Full Service Commencement Date and the Longstop Date.

“**API Funds Pool**” means an Account used by an Integrated Service as a deposit target and source of Value to enable using APIs to add Products to other Accounts, as defined in Appendix 3.9.

“**API Source Code**” means Source Code that enables a Software component to use an API to interoperate or exchange information with another Software component. The term “API Source Code” includes code libraries associated with the API Source Code.

“**APOS Funds Pool**” has the meaning specified in Appendix 2.15.

“**Appendix**” means any of the Appendices and, as applicable, any schedules and attachments thereto, that are appended to this Project Agreement and identified as such in the Table of Contents.

“**Applicable Accessibility Law**” has the meaning specified in Appendix 2.9.

“**Applicable Law**” means:

- (1) Any federal, Commonwealth or local law, statute, code or regulation;
- (2) Any formally adopted and generally applicable rule, requirement, determination, standard, policy, implementation schedule, or other order or directive of any Governmental Body

¹ Amount to be populated based on the Proposal subject to adjustments in respect of Benchmark Interest Rate risk sharing.

having appropriate jurisdiction; and

(3) Any Governmental Approval,

in each case having the force of law and applicable from time to time to the Project or the transactions contemplated hereby.

“Application Programming Interfaces” or **“APIs”** means a System Element consisting of a set of routines, data structures, object classes, API Source Code, source code libraries, communication protocols, or any combination of these or other elements that enables the interoperability or exchange of information between the components of a system or subsystem, including the System and System Elements. The term “API” includes (a) Software interfaces, (b) Updates and Upgrades to APIs, (c) External Interfaces, (d) internal APIs, which interface two System Elements within the System, (e) APIs used or necessary for Integrated Services, (f) APIs as described in Appendix 3.9, and (g) all other APIs called for in this Project Agreement.

“Applied Deductions” means the portion of the Full Deductions incurred by the Systems Integrator and included in the Monthly Payment for that Month as calculated in accordance with Section 1.4 of Appendix 8 (Payment Mechanism).

“Array” means one or more (a) Devices of the same Device Type, (b) AFC 1.0 Gates, or (c) AFC 1.0 FVMs, grouped within a Station, including a line of Gates (a **“Gate Array”**) or FVMs (an **“FVM Array”**).

“Authorization” means a process of checking with an Acquirer to validate funds available on a Payment Card and determine whether the card is authentic. When a merchant enters a credit card transaction, a response (the Authorization) comes back from the issuing bank to the Acquirer and back to the merchant. An Authorization may result in either an approval or declination by the issuing bank.

“Automated Monitoring Subsystem” or **“AMS”** means the System Element described in Appendix 4.6 for the monitoring of the System and the performance of the Operating Services.

“Automatic Refunds” has the meaning specified in Section 2.1.5 of Appendix 3.7.

“Availability Payment” means the compensation to be paid by the MBTA to the Systems Integrator for the Systems Integrator’s performance of the Contract Services, as calculated in accordance with Article 10 and Appendix 8 (Payment Mechanism).

“Available” means, in respect of any System Element, that the System Element is functional and available for use in accordance with all Contract Standards, including the Key Performance Indicators, and **“Availability”** shall be construed accordingly.

“Available Insurance” has the meaning specified in Section 17.1(F).

“Back-End System Element” means any System Element other than a Front-End System Element.

“Background Information” has the meaning specified in Section 5.2(A)(1).

“Bank Debt” means Project Debt other than Bonds.

“Bankruptcy Law” means the United States Bankruptcy Code, 11 U.S.C. 101 et seq. and any similar state or foreign law relating to bankruptcy, insolvency, the rights and remedies of creditors, the appointment of receivers or the liquidation of companies and estates that are unable to pay their debts when due.

“Bankruptcy Related Event” means, in respect of any person:

(1) Any of the following:

(a) The commencement of any voluntary case under, including the filing of a petition seeking to take advantage of, any Bankruptcy Law;

(b) The application for or the consent to the appointment of, or the taking of possession by, a receiver, custodian, trustee, liquidator or similar for itself or for all or a substantial part of its assets, domestic or foreign;

(c) The admission in writing of its inability to pay its debts as they become due;

(d) The making of a general assignment for the benefit of creditors; or

(e) The taking of any corporate (or equivalent) action for the purpose of any of the foregoing; or

(2) The commencement of a case or other proceeding against such person in any court of competent jurisdiction seeking relief under any Bankruptcy Law or the appointment of a receiver, custodian, trustee, liquidator or similar for such person or for all or a substantial part of its assets, domestic or foreign, and, in the case of this clause (2):

(a) Such case or other proceeding is not contested by such person within any applicable period provided under the applicable Bankruptcy Law; or

(b) Such case or proceeding continues without dismissal for a period of 60 days.

“Base Benchmarked Insurance Costs” means:

(1) The greater of:

(a) $[\text{_____}]^2$, Index Linked to account for each annual indexed inflation adjustment occurring prior to the end of the relevant Insurance Review Period; and

(b) Either (i) in respect of the first Insurance Review Period, the Actual Benchmarked Insurance Cost during such first Insurance Review Period, or (ii) in respect of each subsequent Insurance Review Period, the Actual Benchmarked Insurance Cost calculated for the first Insurance Review Period, Index Linked to account for each indexed inflation adjustment occurring during the period commencing with the end of the first Insurance Review Period and prior to the end of the relevant Insurance Review Period,

² To be based on Proposal.

Minus:

- (2) Any Base Benchmarked Insurance Reduction.

“Base Benchmarked Insurance Reduction” means the reduction to be made to the Base Benchmarked Insurance Cost in respect of a risk which has become an Uninsurable Risk or an Insurance Condition which has become an Unavailable Insurance Condition and shall be an amount that is either:

(1) The amount by which the Base Benchmarked Insurance Cost would have been a lesser amount had such risk been an Uninsurable Risk or such Insurance Condition been an Unavailable Insurance Condition as of the Effective Date; or

(2) If it is not reasonably possible to determine an amount pursuant to paragraph (1) of this definition, an amount that is reasonable to be deducted from the Base Benchmarked Insurance Cost having due regard to:

(a) The amount by which the Actual Benchmarked Insurance Cost is less than it would have been as a result of the risk becoming an Uninsurable Risk or the Insurance Condition becoming an Unavailable Insurance Condition, as applicable, (for purposes of this definition, the “actual reduction”);

(b) The size of such actual reduction as a percentage of the Actual Benchmarked Insurance Cost immediately prior to the risk becoming an Uninsurable Risk or the Insurance Condition becoming an Unavailable Insurance Condition, as applicable; and

(c) Changes in the Inflation Index since the Effective Date.

“Base Case Equity IRR” means the Equity IRR calculated at Financial Close pursuant to Appendix 14 (Financial Close Procedures and Conditions).

After a Refinancing, the Base Case Equity IRR will equal the Equity IRR calculated immediately after the Refinancing (taking into account the effect of the Refinancing and using the Financial Model as updated including as to the performance of the Project up to the date of the Refinancing) so as to be current immediately after the Refinancing.

“Base Monthly Payment” or **“BMP”** means, for a Month, the calculation so named and described on Attachment 1 (Monthly Payment calculation worksheet) of Appendix 8 (Payment Mechanism).

“Basic Interchange” means, for a Payment Card transaction occurring in the System:

(1) The published interchange rates applicable to the Payment Card used, except, for American Express Payment Cards, the rate determined as set forth in Section 1.7 of Appendix 4.7; plus

(2) Unavoidable downgrades, assessments and fees charged on a transaction basis which originate from a Payment Card Organization, expressly excluding any which are related to sub-optimal processing or to any Chargeback, and expressly excluding any originating from any PSP; plus

(3) Unavoidable assessments and fees charged on other than a transaction basis (for example, monthly assessments) which originate from a Payment Card Organization, allocated to transactions in the manner set forth in Appendix 4.2, expressly excluding any which are related to sub-optimal processing or to any Chargeback, and expressly excluding any originating from any PSP.

The term “Basic Interchange” expressly excludes any Allowable AP Transaction Fees.

“**Benchmarked Insurances**” means all policies of Required Insurance required to be in place on and after the Revenue Service Commencement Date.

“**Benchmark Interest Rate**” means the publicly-documented interest rates of each maturity included in the following indices:

(1) []³;

The Benchmark Interest Rates do not include any additional credit spread, margin or fee components.

“**Benchmark Interest Rate Adjustment Date**” means the earlier of:

- (1) The Financial Close Deadline;
- (2) 12:01 p.m. on the Financial Close Date;
- (3) The date of execution of any interest rate hedging instrument by the Systems Integrator; or
- (4) The Bond Pricing Date.

“**Benchmark Interest Rate Protection Period**” means the period from the Benchmark Interest Rate Protection Start Date to and including the Benchmark Interest Rate Adjustment Date.

“**Benchmark Interest Rate Protection Start Date**” means the earlier of the date specified in the Interest Rate Addendum to the RFP and the date of issuance of the Interest Rate Addendum.

“**Best Value Fare**” means a composite Fare for one or more Trips as allowed by a Best Value Product.

“**Best Value Product**” means a Product that guarantees a User will be charged the minimum possible Fare for any combination of Trips, as further defined in Appendix 3.7. By way of example only, a Best Value Product may permit a User to take up to 20 Trips within a particular Zone during a one-month period and be charged only the standard Fare for each said Trip based on such Transportation Services used; but if the User takes more than 20 such Trips during such month, the User pays no further amount for the entire month’s travel within the Zone regardless of how many Trips above the 20 trip threshold are taken.

“**Bond**” means any taxable bond.

³ To be updated based on Benchmark Interest Rates selected by the Systems Integrator.

“Bond Pricing Date” means, with respect to any Bonds included in the Systems Integrator’s Financial Plan, the date of the signing of the bond purchase agreement between the Systems Integrator and the bond purchaser(s), or an earlier date on which the interest rates to the Bonds are fixed by the bond purchaser(s).

“Breakage Costs” means any prepayment premiums or penalties, make-whole payments or other prepayment amounts, including costs of early termination of interest rate and inflation rate hedging, swap, collar or cap arrangements, that the Systems Integrator must pay, or that may be payable or credited to the Systems Integrator, under any Funding Agreement or Security Document or otherwise as a result of the payment, redemption, acceleration or reduction of all or any portion of the principal amount of Project Debt prior to its scheduled payment date, excluding, however, any such amounts included in the principal amount of any Refinancing.

“Business Day” means a day other than a Saturday, Sunday, or a holiday recognized and designated in writing from time to time by the MBTA.

“Business Hour” means an hour between 8:00 am and 5:00 pm local time in Boston, Massachusetts on a Business Day.

“Bus Rapid Transit” means the segments of Rapid Transit provided via a bus Vehicle, including the Silver Line.

“Capital Expenditure” means an expenditure related to the Project which is treated as a capital expenditure in accordance with GAAP.

“CERCLA” means the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. 9601 et seq., and applicable regulations promulgated thereunder, each as amended from time to time.

“Change” means any change in the Contract Services relative to what is otherwise permitted or required under this Project Agreement, including Unplanned Expansions and any change or addition to, or replacement of, any Technical Requirement.

“Change Directive” has the meaning specified in Section 11.3.

“Change in Control” has the meaning set forth in Section 15.2(A).

“Change in Costs” means, in respect of any Compensation Event and subject to Appendix 11 (Unit Rates and Change in Cost Methodology) and all other terms and conditions hereof, the effect of that event (whether of a singular or recurring nature, and whether positive or negative) upon the actual or anticipated costs, losses or liabilities of the Systems Integrator, including, as relevant and without double-counting, the following:

(1) The reasonable costs of complying with the requirements of Article 11 (Changes), Article 13 (Supervening Events) or Section 25.2(A), including the reasonable costs of preparation of design and estimates but excluding any costs incurred in meeting its obligations in respect of planning for Expansions in accordance with Section 1.4 of Appendix 2.8;

(2) The reasonable costs of continued employment of, or making redundant, staff who are no longer required;

- (3) The reasonable costs of employing additional staff;
- (4) Reasonable professional fees;
- (5) The reasonable costs to the Systems Integrator of financing the consequences of any Compensation Event, including commitment fees and capital costs, interest and hedging costs, lost interest on any of the Systems Integrator's own capital employed and any finance required pending receipt of a lump-sum payment;
- (6) The effects of costs on implementation of any insurance reinstatement in accordance with this Project Agreement, including any adverse effect on the insurance proceeds payable to the Systems Integrator (whether arising from physical damage insurance or business interruption insurance (or their equivalent)) in respect of that insurance reinstatement and any extension of the period of implementation of the insurance reinstatement;
- (7) Reasonable operating costs, or life cycle, maintenance or replacement costs;
- (8) Capital Expenditures;
- (9) The costs required to ensure continued compliance with the Financing Documents;
- (10) Any deductible or increase in the level of deductible, or any increase in premium under or in respect of any insurance policy; and
- (11) Losses;

provided that in no circumstances shall Change in Costs include any Revenue Impact or any cost incurred due to Systems Integrator Fault.

“Change in Law” means the coming into effect of any Applicable Law enacted after the Proposal Submittal Date or any modification (including repeal) of any Applicable Law existing on the Proposal Submittal Date that comes into effect after the Proposal Submittal Date, compliance with which, in accordance with the Contract Standards, materially expands the scope or materially interferes with, delays or increases the cost of performing the Contract Services; provided that, none of the following shall constitute a Change in Law:

- (1) Any law, statute, code or regulation that has been enacted or adopted on or before the Proposal Submittal Date to take effect after the Proposal Submittal Date;
- (2) The denial, delay in issuance of, or imposition of any term or condition in connection with, any Governmental Approval required for the Contract Services;
- (3) A change in the nature or severity of the actions typically taken by a Governmental Body to enforce compliance with Applicable Law which was in effect as of the Proposal Submittal Date;
- (4) Any increase in any fines or penalties provided for under Applicable Law in effect as of the Proposal Submittal Date;
- (5) Any act, event or circumstance that would otherwise constitute a Change in Law

but that does not change the requirements imposed on the Systems Integrator by the Contract Standards in effect as of the Effective Date;

(6) Any Change in Payment Industry Standards; or

(7) Any change in Tax law other than a Discriminatory Change in Law relating to Tax law or a change in Tax law that eliminates or limits the MBTA's exemption from sales and use Taxes applicable to purchases by any Systems Integrator Person of materials and equipment that become components of the System.

“Change in Payment Industry Standards” means:

(1) The coming into effect of any new Payment Industry Standard which was not in effect or reasonably foreseeable in accordance with Good Industry Practice as of the Proposal Submittal Date; or

(2) Any modification to a Payment Industry Standard which was in effect as of the Proposal Submittal Date to the extent such modification was not reasonably foreseeable in accordance with Good Industry Practice as of the Proposal Submittal Date.

“Change Order” means a written order signed by the MBTA and the Systems Integrator, making a Change, adjusting the compensation payable to the Systems Integrator hereunder, or adjusting any of the scheduled completion dates.

“Chargeback” means a debit of a monetary amount by an Acquirer from an account described in Section 1.3.2 of Appendix 4.7 as a result of a ‘chargeback’ (as understood by reference to Payment Card Organization rules) to a Payment Card transaction that occurred within the System; provided that, as and to the extent that the monetary amount debited includes any fees or costs other than the actual disputed monetary amount of the Payment Card transaction, any fees or costs originating from the Acquirer or any PSP are limited to \$5.00 (five dollars), Index Linked, and any other costs are limited to only those originating from a Payment Card Organization.

“Chargeback and PAYG Loss Baseline” has the meaning specified in Section 6.9 of Appendix 8 (Payment Mechanism).

“CN Equipment” means any physical System Elements needed to satisfy the Communications Network requirements, including communications equipment, network equipment, cabling (including fiber, Ethernet, and power).

“CN Services” means any data communication service needed to satisfy the Communications Network requirements, including the MBTA Layer 2 Services if applicable, the Verizon/MBTA Contract if applicable, any SI-provided or hosted data communications service, any Project Contractor-provided or hosted data communications service, and any data communications service provided by a Subcontractor.

“Collateral Agent” means:

(1) The institutional Lender listed or otherwise designated to act as trustee or agent on behalf of or at the direction of the other Lenders in the Security Documents;

(2) The institutional Lender designated to act as trustee or agent on behalf of or at the direction of the other Lenders in an intercreditor agreement or other document executed by all Lenders or on their behalf to whom Security Documents are outstanding at the time of execution of such document (a copy of which shall be delivered by the Systems Integrator to the MBTA); or

(3) In the event the Project Debt is issued and held by a single Lender, such Lender.

“Commercial Close” means the date established as the Effective Date hereunder.

“Committed Investment” means:

(1) Any form of direct investment of good and immediately available funds by Equity Members, including the purchase of equity shares in and/or the provision of Equity Member Debt to the Systems Integrator; or

(2) An irrevocable written commitment to make the direct investment referenced in clause (1) of this definition, in good and immediately available funds, by a date which is no later than the Scheduled Full Service Commencement Date, coupled with an on demand letter of credit issued by a Qualified Commercial Bank for the account of an Equity Member naming the Systems Integrator as beneficiary and guaranteeing such commitment.

“Commonwealth” means the Commonwealth of Massachusetts.

“Communications Network” or **“CN”** means the CN Equipment and the CN Services implemented, operated, and maintained in accordance with the Technical Requirements, including Appendix 2.5.

“Compensable Delay Period” has the meaning specified in Section 13.5(G).

“Compensation Event” means and is limited to any of the following:

(1) The occurrence of any MBTA Fault;

(2) Any MBTA Change, including the issuance of a Change Directive;

(3) Except to the extent provided in Section 6.3, the existence of a Regulated Condition;

(4) The discovery of asbestos on the Vehicles during the Implementation Period to the extent not disclosed in the Background Information;

(5) A material error in any document listed in Reference Document 1 (excluding the documents identified as 2.b, 2.e., 3.b, 3.e.iii, 4.d., 4.e., 4.e, 4.l., 4.m., 6.e. and 6.f.) to the extent such error existed as of the date and time identified in any such document and could not reasonably have been determined or discovered by the Systems Integrator through due diligence pursuant to Good Industry Practice prior to the Proposal Submittal Date;

(6) Any Qualifying Change in Law;

(7) Subject to Section 13.8, any Change in Payment Industry Standards;

(8) Subject to Section 8.2, any act of Vandalism;

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- (9) Any delay or failure by the MBTA to achieve a DB Completion Milestone by the applicable DB Completion Date in accordance with Section 6.5;
- (10) Any defects in the DB Installation Work to the extent described in Section 6.5(H)(7);
- (11) Any MBTA Step-In Action, subject to Section 21.5(D);
- (12) The occurrence of an Extended Event, as and to the extent provided in Section 24.6(D)(1);
- (13) The expiration without renewal of, or a material increase in pricing under, the Verizon/MBTA Contract, as and to the extent provided in Appendix 2.5;
- (14) Any damage to the System caused by MBTA Service Failures;
- (15) Any damage to, interruption of or interference with the Project caused by:
- (a) A capital works project (other than the Project or the DB Installation Work) by the MBTA or another Governmental Body (or any contractor on behalf of the MBTA or another Governmental Body);
 - (b) Any work performed by the MBTA (or any MBTA Person) at any Location pursuant to Section 11.1(E);
 - (c) Any failure of compliance with the DB Plans and Specifications;
 - (d) Any work performed by the MBTA or the DB Entity in respect of punch list items described in Section 6.5(H)(7)(a); or
 - (e) Except to the extent the Systems Integrator bears the related cost responsibility under Section 6.5(I), any work performed by the DB Entity under the DB Contract that is not required by the DB Plans and Specifications;
- (16) The Issuance of a temporary restraining order, preliminary or permanent injunction or other form of interlocutory relief by a Governmental Body under Applicable Law that materially and adversely affects the MBTA's or the Systems Integrator's performance under this Project Agreement, except to the extent resulting from Systems Integrator Fault;
- (17) The issuance of a rule, order or directive from the U.S. Department of Homeland Security or comparable Commonwealth agency regarding specific security threats to the Project or the region in which the Project is located or which the Project serves, to the extent such rule, order or directive requires specific changes in the Systems Integrator's normal design, implementation, operation or maintenance procedures in order to comply;
- (18) The occurrence of a Relief Event (excluding Items (9) and (10) of the definition thereof), to the extent such occurrence results in an adjustment to any APC Milestone Date pursuant to Section 13.4;
- (19) Subject to Appendix 3.1, the occurrence of an Incident to the extent such Incident was not caused by any Systems Integrator Person and could not reasonably have been prevented

through the employment of the best practices being employed in the commercial information security industry in the United States at the time of such Incident;

In each case, subject to all terms and conditions of Article 13 (Supervening Events).

“Complete DB Plans and Specifications” means the plans and specifications for the performance of the DB Installation Work, as prepared and finalized by the Systems Integrator based on the Preliminary DB Plans and Specifications pursuant to Appendix 2.13 and accepted by the MBTA pursuant to this Project Agreement.

“Compliance Matrix” has the meaning specified in Appendix 2.16.

“Compliance Report” means Documentation providing evidence of compliance and highlighting any noncompliance with the Technical Requirements.

“Computation Report” has the meaning specified in Appendix 4.2.

“Conceptual Design Review” means the first of three stages of Design Review, as further described in Appendix 7 (MBTA Review Procedures).

“Confidential Information” means information of a Party or any of its Affiliates or licensors or contractors, that the Party has designated as confidential and which is supplied, or to which access is granted, to or on behalf of the other Party (whether before or after the Effective Date), either in writing, or in any other form, directly or indirectly pursuant to discussions with the other Party and includes all analyses, compilations, studies and other documents whether prepared by or on behalf of a Party which contain or otherwise reflect or are derived from such designated information.

“Configure” means the act by the MBTA of directing the Systems Integrator to change, alter, set or choose characteristics, limitations, settings, or other attributes of System functions in accordance with Appendix 4.3, and the terms **“Configurable”**, **“Configured”**, **“Configurably,”** **“Configurability”** and **“Configuration”** shall be construed accordingly.

“Configured Fare” means the monetary amount due or the Products (and portions thereof) accepted in exchange for use of Transportation Services which meets the criteria as set forth in, and is calculated in accordance with, the Fare Policy.

“Contactless EMV Credential” means a Credential issued or provisioned by a Payment Card Organization presented to the System using an NFC Device, contactless Payment Card or wearable.

“Contactless EMV Level 1” or **“EMV Level 1”** means the standards and any Payment Industry Standards identified as such by EMVCo, LLC, and any successor standards.

“Contactless EMV Level 2” or **“EMV Level 2”** means the standards and any Payment Industry Standards identified as such by EMVCo, LLC, and any successor standards.

“Contactless EMV Level 3” or **“EMV Level 3”** means the standards identified as such by EMVCo, LLC, and any successor standards.

“Contract Administration Memorandum” has the meaning set forth in Section 25.3.

“Contract Services” means the Implementation Work and the Operating Services.

“**Contract Standards**” means the standards, terms, conditions, methods, techniques and practices imposed or required by:

- (1) Applicable Law;
- (2) The Payment Industry Standards;
- (3) Good Industry Practice;
- (4) The Technical Requirements;
- (5) The Key Performance Indicators;
- (6) The Insurance Requirements;
- (7) Any Submittals which have been accepted by the MBTA in final form pursuant to Appendix 7 (MBTA Review Procedures), including final design documents approved by the MBTA pursuant to Final Design Review;
- (8) Applicable written equipment manufacturers’ specifications, requirements and recommendations; and
- (9) Any other standard, term, condition or requirement specifically provided in this Project Agreement to be observed by the Systems Integrator.

“**Contract Year**” means a period commencing on (and including) the Effective Date and ending on the first anniversary thereof, and each subsequent period of 12 months thereafter until and including the Termination Date.

Any computation made on the basis of a Contract Year shall be adjusted on a pro rata basis to take into account any Contract Year of less than 365 or 366 days, whichever is applicable.

“**Cost-Certain Specifications**” has the meaning specified in Appendix 2.13.

“**Cost to Complete**” means in respect of any termination of this Project Agreement that occurs on or prior to the Full Service Commencement Date, all Losses that the MBTA determines it is reasonably likely to incur as a direct result of the termination of this Project Agreement, including (without double-counting):

- (1) Those costs (internal and external) that the MBTA reasonably and properly projects that it will incur in carrying out any process to request tenders from any parties interested in entering into a contract with the MBTA to achieve the Criteria for Full Service Commencement, including all costs related to the preparation of tender documentation, evaluation of tenders and negotiation and execution of relevant contracts; *plus*
- (2) Those costs (internal and external) reasonably projected to be incurred by the MBTA in relation to:
 - (a) Remediation of any defective Implementation Work; and
 - (b) Rectification or cure of any breach of this Project Agreement by the Systems Integrator; *plus*

(3) Costs that the MBTA reasonably and properly projects that it will incur in achieving the Criteria for Full Service Commencement, including additional costs associated with operating the Existing System until the Full Service Commencement Date; *plus*

(4) Any other Losses that the MBTA would, but for the termination of this Project Agreement, not have incurred prior to the achievement of the Criteria for Full Service Commencement, which may include costs associated with the termination, changes in the scope of the DB Installation Work and costs associated with maintaining continued operations of the Existing System; *minus*

(5) Any amounts standing to the credit of the Vandalism Reserve Account, the External Interfaces Reserve Account, the Unplanned Expansions Reserve account or the Physical Damage Proceeds that the MBTA is entitled to retain pursuant to this Project Agreement; *minus*

(6) Any insurance proceeds available to the MBTA for the purposes of achieving the Full Service Commencement Date.

“COTS” or **“commercially off the shelf”** means Software, hardware or other technology that is generally available for purchase on the open market for use without customization.

“Coverage Principle” means the method of determining the Locations at which the Systems Integrator must provide a Point of Sale to meet User needs.

“Covered Systems Integrator Claim” has the meaning specified in Section 16.6(C).

“Credential” means Data or a payment application, residing on Media, that interacts with the System for the purpose of, by way of accepting or denying a Tap, interfacing with an Account, or other purposes stated in the Technical Requirements.

“Criteria for Full Service Commencement” has the meaning specified in Appendix 5.6.

“Criteria for Installation” has the meaning specified in Appendix 5.2.

“Criteria for Revenue Service Commencement” has the meaning specified in Appendix 5.4.

“Criteria for Transition Period Completion” has the meaning specified in Appendix 5.5.

“Cure Period” means, with respect to a Performance Failure, the period set out in Table 4 of Appendix 8 (Payment Mechanism), subject to Section 3 of Appendix 8 (Payment Mechanism), commencing at the Logged Failure Time during which the Systems Integrator must effect a Rectification in order to avoid incurring a corresponding Performance Deduction.

“Custom Fare Card” means Media that the a third party may customize in labeling and appearance for the purposes of, among other things, employee and student identification cards, as further described in Appendix 4.4.

“Customer” means any User who interacts with the System to exchange a monetary amount for Value or access Transportation Services.

“Customer-Facing Device” means a Gate, an FVM, or a Validator.

“Customer Support Software” means the tools used to support MBTA customer service efforts in providing Account management functionality, including the IVR, the Administrator Interface and the associated APIs.

“Data” means:

- (1) Aggregate Data;
- (2) Fare Data;
- (3) Payment Card Data;
- (4) Personal Information;
- (5) System Data Output;
- (6) Data that is in-process, under calculation, or that otherwise resides in the System before becoming System Data Output;
- (7) User Data; and
- (8) all other data (in any form) related to the System, relating to use of the System or System Website (including use of the System or System Website by the public), or relating to MBTA Activities, including Data input into, processed or stored by, or output from the System or System Website.

The term “Data” includes Confidential Information as applicable.

“Date of Award” means [____ __, 2017]. *[Date to be inserted will be the date on which the MBTA’s governing board has authorized the award of this Project Agreement to the Systems Integrator.]*

“DB Completion Date” means a scheduled date for the achievement of a DB Completion Milestone, as set forth in the Project Schedule most recently accepted by the MBTA.

“DB Completion Milestone” means the achievement of substantial completion pursuant to the DB Plans and Specifications of all DB Installation Work required in respect of a Key Milestone, as established by the DB Plans and Specifications and including each associated Defined Phase.

“DB Contract” means the design-build contract to be entered into by and among the MBTA and the DB Entity to provide for the performance of the DB Installation Work.

“DB Dispute” has the meaning specified in Section 20.2(A).

“DB Dispute Review Board” has the meaning specified in Section 20.2(A).

“DB Entity” means the counterparty to the MBTA under the DB Contract.

“DB Governmental Approvals” means Governmental Approvals required for the performance of the DB Installation Work.

“DB Installation Work” means the Installation design and construction work pertaining to System installation, and related removal work pertaining to the Existing System, at Stations, Stops and all other Locations (excluding Retail Reload Locations, SI Locations and Vehicles), as specified in the DB Plans and Specifications.

“DB Plans and Specifications” means the Complete DB Plans and Specifications, as further described in Appendix 2.13.

“Deductions” means those deductions from the otherwise applicable Monthly Payment that the MBTA is permitted to take as offsets on account of specified instances of non-performance, as described in Appendix 8 (Payment Mechanism).

“Defect” means any unexpected error or delay, malfunction, process or sequencing issue, or any other anomaly that produces an unexpected result in the operation of the System.

“Deferred Equity Amounts” means on any date, any amount of unfunded equity that has been committed to the Systems Integrator (including commitments to provide an Equity Investment or Equity Member Debt) and is shown to be available for use in the Financial Model prior to the Full Service Commencement Date, but only to the extent that the commitment to provide such amount is supported by an irrevocable on-demand letter of credit issued by a Qualified Commercial Bank for the account of an Equity Member naming the Systems Integrator and/or the Collateral Agent as beneficiary and guaranteeing the provision of the committed amount by a date which is not later than the Full Service Commencement Date.

“Defined Phase” has the meaning specified in Section 6.5(H).

“Deliverable” means all items of any nature required to be provided by the SI pursuant to this Project Agreement. By way of example, and not limitation, the term “Deliverable” includes: (a) System Elements; (b) Data; (c) System APIs; (d) System Documentation; (e) the System Website; (f) encryption keys and passwords; (g) Credentials; and (h) all components thereof and Updates and Upgrades (where applicable) thereto.

“Design Review” means an iterative process to develop, submit, review and improve the System design, including Conceptual Design Review, Preliminary Design Review and Final Design Review, as further described in Appendix 7 (MBTA Review Procedures).

“Device” means any Gate, Fare Vending Machine, Inspection Device, Reader or Validator and any Variants thereof and all System Elements upon which the preceding is dependent to operate in accordance with the Technical Requirements.

“Device Type” means a classification of Devices based on function into the following categories: Gates, FVMs, Inspection Devices, Validators, and Readers.

“Direct Refund” means the return of a monetary amount paid by a Customer through the System to the Customer via Payment Card, ACH or check.

“Discriminatory Change in Law” means a Change in Law, the terms of which apply to:

- (1) The Project or similar privately financed, performance-based projects;
- (2) Private operators of automated fare collections systems; or

- (3) The Systems Integrator or any Project Contractor;

Provided that, in each case, such Change in Law is not of general application to other persons or projects, as applicable.

“Dispute Resolution Procedures” means the procedures for the resolution of disputes between the Parties set forth in Article 20 (Dispute Resolution Procedures).

“Distributed Locations” has the meaning specified in Appendix 2.10.

“Distribution” means, whether in cash or in kind, any:

- (1) Dividend or other distribution in respect of shares or other capital;
- (2) Reduction of capital, redemption or purchase of shares or any other reorganization or variation to share capital;
- (3) Payments by the Systems Integrator under the Equity Members Funding Agreements (whether of principal, interest, breakage costs or otherwise);
- (4) Payment, loan, contractual arrangement or transfer of assets or rights directly, to the extent (in each case) it was put in place after the Financial Close Date and was neither in the ordinary course of business nor on reasonable commercial terms; or
- (5) Receipt of any other benefit which is not received in the ordinary course of business and not on reasonable commercial terms.

“Document Control System” or **“DCS”** has the meaning specified in Appendix 7 (MBTA Review Procedures).

“Documentation” means Data designed to assist in the implementation, integration, use, troubleshooting, maintenance, repair or end-of-life of a technology, component, subsystem, or system, including specifications, requirements documents, engineering manuals, user manuals, training materials, use cases, test cases, test results, handbooks, informational diagrams, system and subsystem architecture designs and documents, database schemas, drawings, blueprints, plans, engineering changes, and other similar materials. The term “Documentation” includes Updates and Upgrades to such Documentation.

“Draft Reinstatement Plan” has the meaning specified in Section 17.4(A).

“Early Works Agreement” means the agreement entered into by and among the MBTA and [*name of Lead Design and Installation Firm*] to provide for the performance of Implementation Work in advance of the Effective Date.

“Earn Back” means a credit to the Availability Payment calculated in Accordance with Attachment 1 to Appendix 8.

“Effective Date” means the latest date this Project Agreement is executed and delivered by an authorized signatory of the Systems Integrator and by an authorized signatory of the MBTA.

“Egress Standards” means the National Fire Prevention Association standard NFPA 130, and all other Applicable Law relating to the safe egress of any Persons from Locations.

“Eligible Existing System Components” means those designs, drawings, test procedures, and specifications embodied in any documents and materials relating to the Existing System that the MBTA provides to the Systems Integrator for the Systems Integrator's use in the System; provided that such documentation and material:

- (1) Is provided by the MBTA to the Systems Integrator; and
- (2) Is specifically identified by the MBTA as an Eligible Existing System Component by the use of an explicit legend on the document or material identifying it as such.

“Eligible Subtractions from Fare Revenue” means the total Monthly monetary amount of Chargebacks, PAYG Loss and Basic Interchange that may be applied as an offset to Fare Revenues, as determined and applied in accordance with Appendix 4.2.

“Eligible Subtractions Report” has the meaning specified in Appendix 4.2.

“EMC” means IEC Electromagnetic Compatibility Standard (62236-3-2).

“Employee Redundancy Payments” means the payment of all wages earned, accrued unused vacation time, and any other payments required to be made by the Systems Integrator to its employees under law, or under the terms and conditions of Systems Integrator's employment agreements with its employees, as a direct result of termination of this Project Agreement pursuant to Article 24 (Termination), as applicable.

“EMV” means the technical standards for payment cards and payment terminals managed by EMVCo, LLC, including standards:

- (1) To ensure interoperability between:
 - (a) Integrated circuit payment cards (also referred to as “IC cards” and “chip cards”); and
 - (b) point of sale terminals, automated teller machines and other IC card processing devices; and
- (2) To authenticate associated Payment Card transactions.

“EMV Card” means any Payment Card that contains a microchip or chip technology in accordance with EMV specifications and standards.

“Enable” means a process within the System that causes a Fare Card to become Enabled upon either the payment of an Enablement Fee by a Customer or the waiver of the Enablement Fee applicability to a Fare Card by Configuration or Fare Policy.

“Enabled” means a state of an Activated Fare Card in which the Fare Card is eligible, subject also to Configuration and Fare Policy, to be accepted via Tap at a Reader.

“Enablement Fee” is the Configurable price charged to Customers to Enable a Fare Card.

“Encumbrance” means any Lien, lease, mortgage, security interest, charge, judgment, judicial award, attachment or encumbrance of any kind with respect to the Project.

“Enhanced Fare Card” means Fare Cards that the MBTA may customize in labeling and appearance for the purposes of, among other things, MBTA employee and contractor identification cards and MBTA Personnel Accounts.

“Equity Investment” means:

(1) Any form of direct investment by Equity Members, including the purchase of newly issued equity shares or other equity interests in and/or the provision of Equity Member Debt to the Systems Integrator; and

(2) Any draws by or on behalf of the Systems Integrator, as applicable, of the letter(s) of credit described in the definition of Deferred Equity Amount

“Equity IRR” means the nominal post-tax internal rate of return to the Committed Investment described in clause (1) of the definition of Committed Investment over the full Term calculated, using the Financial Model, as the discount rate that, when applied to Committed Investment cash flows, gives a zero net present value; provided that:

(1) The phrase “post-tax” refers only to a single level of U.S. federal and Commonwealth income tax liability of the Systems Integrator or its Equity Members, calculated at a rate no greater than the maximum rate charged to domestic corporations and taking into account the deductibility of state and local taxes for federal purposes, and specifically excludes (a) any foreign income tax and other tax of any kind and (b) any withholding tax for federal, state and local tax purposes, including any tax that the Systems Integrator or an Equity Member is obligated to withhold on Distributions (whether actual or constructive) or other payments or allocations to Equity Members or holders of debt of or equity interests in an Equity Member under 26 U.S.C. §§ 1441 — 1446, notwithstanding 26 U.S.C., § 1461, or any similar Commonwealth or local Law; and

(2) The phrase “cash flows” refers to Distributions, minus Committed Investment described in clause (1) of the definition of Committed Investment.

“Equity Member” means any person with a direct equity interest in the Systems Integrator.

“Equity Member Debt” means any obligations created, issued or incurred by the Systems Integrator for borrowed money that:

(1) Is owed to any Equity Member or any Affiliate thereof; and

(2) Is subordinated in priority of payment and security to all Project Debt held by persons who are not Equity Members.

“Equity Member Funding Agreement” means any loan agreement, credit agreement or other similar financing agreement or subordination agreement providing for or evidencing Equity Member Debt.

“Escrow Agent” has the meaning specified in Section 16.4(A).

“Escrow Agreement” has the meaning specified in Section 16.4(A).

“Exceptional Cost” means, in respect of an Insurance Review Period, if there is an Insurance Cost Increase greater than 30% of the Base Benchmarked Insurance Cost for that Insurance Review Period, the amount of such Insurance Cost Increase in excess of 30% of the Base Benchmarked Insurance Cost for that Insurance Review Period.

“Exceptional Saving” means, in respect of an Insurance Review Period, if there is an Insurance Cost Decrease greater than 30% of the Base Benchmarked Insurance Cost for that Insurance Review Period, the amount of such Insurance Cost Decrease in excess of 30% of the Base Benchmarked Insurance Cost for that Insurance Review Period.

“Excess Chargebacks and PAYG Losses” means any Chargebacks and PAYG Losses for a Month which are, collectively, in excess of an applicable Chargeback and PAYG Loss Baseline, as determined in accordance with Appendix 4.2.

“Excluded Element” has the meaning specified in Section 16.1(A).

“Exempt Refinancing” means:

- (1) Any Refinancing to the extent that it was fully and expressly taken into account in the Financial Model and calculation of the Availability Payments;
- (2) Amendments, modifications, supplements or consents to Financing Documents (excluding extensions and renewals), and the exercise by a Lender of rights, waivers, consents and similar actions in the ordinary course of day-to-day loan administration and supervision that, in each case, do not individually or in the aggregate provide a financial benefit to the Systems Integrator;
- (3) A change in taxation or change in accounting treatment pursuant to changes in Applicable Law or GAAP;
- (4) Any of the following acts by a Lender:
 - (a) The syndication of any of such Lender’s rights and interests in the senior Financing Documents;
 - (b) The grant by such Lender of any rights of participation, or the disposition by such Lender of any of its rights or interests, in respect of the Financing Documents in favor of any other Lender or any other investor; or
 - (c) The grant by such Lender of any other form of benefit or interest in either the senior Financing Documents or the revenues or assets of Systems Integrator, whether by way of security or otherwise, in favor of any other Lender or any investor;
- (5) any amendment, variation, or supplement of any Financing Documents in connection with the funding of an MBTA Change pursuant to Article 11 (Changes) or pursuant to Section 14.5;
- (6) a re-set of an interest rate pursuant to the express terms of any Financing Documents; or

(7) any sale of any equity interests in the Systems Integrator by an Equity Member or securitization of the existing rights or interests attaching to any equity interests in the Systems Integrator or its direct, 100% Equity Member, if any.

“Existing System” means the existing fare collections system serving the Transportation Network, including all improvements, equipment and software operated and maintained by the MBTA in respect of fare collections for the Transportation Network as of the Effective Date and through the Full Service Commencement Date, but excluding any System Element, any Eligible Existing System Components or Implementation Work.

“Expansion” means a Location Expansion, a Vehicle Expansion, or a Reader Expansion, each also being either a Planned Expansion or an Unplanned Expansion.

“Expiration Date” means the last day of the Initial Term or, subject to Section 3.1, any Renewal Term.

“Extended Event” has the meaning set forth in Section 24.6(A).

“Extension Fare” means an additional charge to a User who travels beyond the geographic, temporal, or other limitations of the Product used to access Transportation Services.

“External Interface” means a System Element that exchanges Data between the System and other information systems.

“External Interfaces Reserve” has the meaning specified in Section 11.4(B).

“Fare” means the Configured Fare applicable to a particular Trip or Product for a particular User at the point in time when the Trip began or the Product was purchased.

“Fare Card” means Media provided or provisioned for use in the System by the SI, including Standard Fare Cards, Temporary Fare Cards, Enhanced Fare Cards and Custom Fare Cards.

“Fare Card Mobile Application” means a possible implementation to support the Mobile Fare Card, as further described in Appendix 2.6.

“Fare Data” means Data relating to each User’s payment for and usage of Transportation Services.

“Fare Policy” means the MBTA’s policies and guidelines for establishing and structuring the fares to be charged to Users for access to and use of the Transportation Network, as adopted and amended from time to time by the MBTA.

“Fare Revenue” means all revenue due from the Systems Integrator to the MBTA, as determined in accordance with Appendix 4.2 and including all amounts so determined in respect of any RTP.

“Fare Vending Machine” or **“FVM”** means a Device providing for dispensing of Fare Cards and purchase of Products, as more particularly described in Appendix 2.3, and including Full-Functionality FVM and Limited-Functionality FVM.

“Federated Identity Services” has the meaning specified in Appendix 3.1B.

“Fees and Costs” means reasonable fees and expenses of employees, attorneys, architects, engineers, expert witnesses, contractors, consultants and other persons, and costs of transcripts, printing of briefs and records on appeal, copying and other reimbursed expenses, and expenses reasonably incurred in connection with investigating, preparing for, defending or otherwise appropriately responding to any Legal Proceeding.

“Final Design Review” means the third of three stages of Design Review, as further described in Appendix 7 (MBTA Review Procedures).

“Financial Close” means satisfaction or waiver of the Financial Close Conditions in accordance with Section 4.1 and Appendix 14 (Financial Close Procedures and Conditions).

“Financial Close Amendment” has the meaning specified in Section 6 of Appendix 14 (Financial Close Procedures and Conditions).

“Financial Close Conditions” means the Systems Integrator Conditions Precedent and the MBTA Conditions Precedent.

“Financial Close Date” means the date on which Financial Close occurs.

“Financial Close Deadline” has the meaning specified in Section 4.3.

“Financial Close Security” means the letter of credit required of the Systems Integrator pursuant to Section 4.4 in the form set forth in Transaction Form A.

“Financial Close Termination Sum” means:

- (1) \$500,000; *plus*
- (2) The lesser of:

(a) The Systems Integrator’s reasonable and proper costs (without mark-up for overhead or profit) incurred in performing Implementation Work and seeking to achieve Financial Close from the Date of Award through the date of any notice of termination delivered pursuant to Appendix 14 (Financial Close Procedures and Conditions); and

- (b) \$1,000,000.

“Financial Model” means:

- (1) For purposes of the Systems Integrator’s representations as to the Financial Model as of the Effective Date and prior to the Financial Close Date, the Preliminary Financial Model; and
- (2) For all other purposes, including the Systems Integrator’s representations as to the Financial Model as of the Financial Close Date, the financial model delivered by the Systems Integrator to the MBTA in connection with Financial Close, as updated and replaced from time to time in accordance with the terms of this Project Agreement.

“Financial Plan” means Systems Integrator’s plan for financing the Project, which plan is set forth in Preliminary Financial Model (Appendix 15) and is substantially the same as that submitted by the Systems Integrator with the Proposal.

“Financing Costs” means in respect of any Compensable Delay Period, the aggregate of:

- (1) All amounts of principal payments that will fall due for payment under the Financing Documents during that Compensable Delay Period;
- (2) All amounts (excluding default interest) of interest, together with any commitment or standby fees on undrawn loan facilities, that accrue under the Financing Documents during that Compensable Delay Period; and
- (3) Reasonable financing costs and expenses that accrue under the Financing Documents during that Compensable Delay Period; provided that:
- (4) Without limiting anything under Section 13.6, any amount in respect of Financing Costs for any Compensable Delay Period following Transition Period Completion shall be limited to amounts that exceed the amount of APC payments actually made by the MBTA during the Compensable Delay Period.

“Financing Documents” means the Funding Agreements and the Security Documents, together with any other documents designated as such by the Parties in accordance with the terms and conditions of this Project Agreement.

“Financing Period” means the period from and including the Effective Date through the Financial Close Date.

“First Handback Inspection” has the meaning specified in Section 2.8 of Appendix 9 (Handback Requirements).

“First Handback Reserve Amount” has the meaning specified in Section 8.5(A).

“Fiscal Year” means each of:

- (1) The period from the Effective Date to the next June 30th;
- (2) Each subsequent period of 12 calendar months commencing on July 1st; and
- (3) The period from July 1st in the year in which this Project Agreement expires or is terminated (for whatever reason) to and including the Termination Date.

Any computation made on the basis of a Fiscal Year shall be adjusted on a pro rata basis to take into account any Fiscal Year of less than 365 or 366 days, whichever is applicable.

“Fitch” means Fitch Ratings Ltd., or any of its successors and assigns. If such corporation is dissolved or liquidated or no longer performs the functions of a securities rating agency, “Fitch” shall be deemed to refer to any other nationally-recognized securities rating agency designated by the MBTA.

“Force Majeure Event” means any:

- (1) War, civil war, invasion, violent act of foreign enemy or armed conflict;
- (2) Act of terrorism or sabotage (excluding Vandalism and any Incident if the Systems Integrator is the Affected Party);
- (3) Nuclear, chemical or biological contamination or emissions (including, as applicable, associated radiation), excluding such contamination the source or cause of which is the result of any actions of, inaction by, or breach of contract or Applicable Law by the Party claiming to be affected;
- (4) Blockade or embargo; or
- (5) Labor dispute, including a strike, lockout or slowdown, generally affecting the transit industry in the MBTA Service Area or a significant sector of it and excluding:
 - (a) If the Systems Integrator is the Affected Party, any such labor dispute affecting only the employees of any Systems Integrator Person; and
 - (b) If the MBTA is the Affected Party, any such labor dispute affecting only the employees of any MBTA Person;

In each case, that occurs after the Effective Date and that directly prevents or delays either Party (the **“Affected Party”**) from performing all or a material part of its obligations under this Project Agreement.

“Front-End System Element” means any Customer-Facing Device, the System Website, and APIs required in Appendix 3.9.

“Full Deduction” means the aggregate of the System Availability Deductions and Performance Deductions incurred by the Systems Integrator for a Month as calculated in accordance with Section 1.4 of Appendix 8 (Payment Mechanism).

“Full-Functionality FVM” or **“Full Functionality FVM”** means a Variant of FVM, as more particularly described in Appendix 2.3.

“Full Service Commencement Certificate” has the meaning specified in Section 6.11(G)(1).

“Full Service Commencement Date” has the meaning specified in Section 6.11(G).

“Fundamental DB Modification” means any amendment or modification to the DB Plans and Specifications (or, if prior to the finalization of the Complete DB Plans and Specifications, the Preliminary DB Plans and Specifications) that:

- (1) Is not required to achieve compliance with the Contract Standards; and
- (2) Would be reasonably likely to increase the cost of the performance of the Contract Services, including the cost of any lifecycle rehabilitation work contemplated hereunder.

“Funding Agreements” means the documents identified as such in the Lenders’ Remedies Agreement and executed on or about Financial Close to evidence senior Project Debt, together with any other documents designated as such by the Parties in accordance with the terms and conditions of this Project Agreement.

“FVM Required Location” has the meaning specified in Appendix 2.10.

“GAAP” means generally accepted accounting principles in effect and consistently applied in the United States (including the accounting recommendations published in the Handbook of the American Institute of Certified Public Accountants).

“Gate” means a Device located in a Station that admits or denies Users access to the Transportation Network, as more particularly described in Appendix 2.3.

“Gated Station” means a Station at which a User must pass through a Gate to access Transportation Services.

“Gate Console” means the physical enclosure located on either side of Gate doors containing all motors, computers and sensors making up the Gate mechanism.

“Gate Option” means the Systems Integrator's method for transitioning from the Existing System in respect of Gates, selected as provided in Appendix 2.3 from among Gate Option 1, Gate Option 2, Gate Option 3, and Gate Option 4.

“Gate Option 1” means an approach to the transition from the Existing System to the System in respect of Gates in which AFC 1.0 Gates are individually replaced by new Gates not using any AFC 1.0 Equipment, with such replacement staged so as to provide for adequate User throughout scaled to User adoption of the System, as more particularly described in Appendix 2.3.

“Gate Option 2” means an approach to the transition from the Existing System to the System in respect of Gates in which AFC 1.0 Gates are replaced with new Gates that retain AFC 1.0 Equipment sufficient to permit acceptance of AFC 1.0 Media at such Gates throughout the Transition Period, and thereafter brings about removal of all AFC 1.0 Equipment from the Gates or their complete replacement, as more particularly described in Appendix 2.3.

“Gate Option 3” means an approach to the transition from the Existing System to the System in respect of Gates in which the enclosures of AFC 1.0 Gates are re-used in the implementation of new Gates that retain AFC 1.0 Equipment sufficient to permit acceptance of AFC 1.0 Media at such Gates throughout the Transition Period, and thereafter brings about removal of all AFC 1.0 Equipment from the Gates (except optionally the enclosure) or their complete replacement, as more particularly described in Appendix 2.3.

“Gate Option 4” means an approach to the transition from the Existing System to the System in respect of Gates in which System Elements are added to AFC 1.0 Gates so as to permit Media acceptance at AFC 1.0 Gates during the Transition Period, along with acceptance of AFC 1.0 Media until the end of the Transition Period, and thereafter brings about implementation of new Gates which replace the AFC 1.0 Gates and removes all AFC 1.0 Equipment from the Gates (except optionally the enclosure), as more particularly described in Appendix 2.3.

“Gate Transition Demonstration” means a demonstration of the Gate Option(s) selected by the SI, as further described in Appendix 2.16.

“Good Industry Practice” means those methods, techniques, standards and practices which, at the time they are to be employed and in light of the circumstances known or reasonably believed to exist at such time, are generally recognized and accepted as good practice in the design, installation, integration, commissioning, testing, operation, maintenance, and management of automated,

account-based open fare collections systems serving purposes similar to the System, as observed in North America, Europe and Australia.

“Governmental Approvals” means all permits, licenses, authorizations, consents, certifications, exemptions, rulings, entitlements and approvals issued by a Governmental Body of whatever kind and however described which are required under Applicable Law to be obtained or maintained by any person with respect to the Contract Services.

“Governmental Body” means any federal, Commonwealth, regional or local legislative, executive, judicial or other governmental board, department, agency, authority, commission, administration, court or other body (including the MBTA, acting in its governmental capacity other than as a party to this Project Agreement), or any official thereof, having jurisdiction in any way over or in respect of any aspect of the performance of this Project Agreement or the Project.

“Group” means a corporation, university, governmental entity or another entity consisting of one or more actual or potential Users and Group Administrators that seeks to have or does have a Group Account.

“Group Administrator” means a person authorized to administer a Group Account.

“Guarantor” means any parent company guarantor of a Project Contractor’s obligations under a Project Contract.

“Guaranty Agreement” means the written agreement of a Guarantor to guarantee the performance of a Project Contract by the applicable Project Contractor.

“Handback Certificate” has the meaning specified in Section 2.15 of Appendix 9 (Handback Requirements).

“Handback Inspection Report” means the initial, second and final reports describing the results of the Handback Inspections, prepared in accordance with Section 2 of Appendix 9 (Handback Requirements).

“Handback Inspections” means the inspections carried out pursuant to Section 2 of Appendix 9 (Handback Requirements), including the First Handback Inspection and the second and final Handback Inspections.

“Handback Letter of Credit” has the meaning specified in Section 8.6(A).

“Handback Period” means the period commencing on the date which is two years prior to the Expiration Date and ending on the Expiration Date.

“Handback Plan” has the meaning specified in Section 2.4 of Appendix 9 (Handback Requirements).

“Handback Requirements” means the terms, conditions, requirements and procedures governing the condition in which the Systems Integrator is to deliver the System to the MBTA on the Expiration Date, as set forth in Appendix 9 (Handback Requirements).

“Handback Reserve Account” has the meaning specified in Section 8.4(B).

“Handback Reserve Amount” means the First Handback Reserve Amount or the Second Handback Reserve Amount, as applicable during the Handback Period.

“Handback Warranty” has the meaning specified in Section 2.2 of Appendix 9 (Handback Requirements).

“Handback Work” has the meaning specified in Section 2.8.3 of Appendix 9 (Handback Requirements).

“Handoff” means required coordination between the Systems Integrator and the MBTA to resolve any issue with an MBTA-Provided Facility which has impacted a System Element or caused a Performance Failure, as further described in Appendix 4.6.

“Hazardous Substance” means any hazardous waste, hazardous product, contaminant, toxic substance, deleterious substance, dangerous good, pollutant, waste, reportable substance, and any other substance, in respect of which the storage, manufacture, handling, disposal, treatment, generation, use, transport, remediation or release into or presence in the environment is prohibited, controlled or regulated under Applicable Law pertaining to the environment or otherwise, or capable of causing harm to human health or the environment, including “hazardous substances” as defined under CERCLA and “hazardous waste” as defined under RCRA.

“Hedging Arrangements” means any Financing Documents entered into for purposes of hedging the Systems Integrator’s exposure to interest rate risk.

“Hedging Liabilities” means all amounts due from the Systems Integrator to the Lenders by reason of the early termination of any Hedging Arrangements.

“Hedging Receipts” means all amounts due to the Systems Integrator from the Lenders by reason of the early termination of any Hedging Arrangements.

“IEC” means the International Electrotechnical Commission, and any successor organization.

“Implementation Contract Amount” means [●],⁴ as may be amended by any Change Orders which have the effect of changing the Implementation Contract Amount.

“Implementation Period” means the period from and including the Effective Date through the Full Service Commencement Date and the completion of all SI Installation Work relating to the removal of the Existing System from Vehicles.

“Implementation Proposal” has the meaning specified in Section 11.2(B).

“Implementation Work” means everything required to be furnished and done for and relating to the design, installation, integration, commissioning and testing of the System by the Systems Integrator pursuant to this Project Agreement during the Implementation Period, including all SI Installation Work (but excluding the DB Installation Work) and all completed structures, assemblies, fabrications, acquisitions and installations.

“Implementation Work Value” means an amount equal to the Implementation Contract

⁴ To be included based on proposal

Amount minus the Cost to Complete.

“Incident” means an event that actually jeopardizes the confidentiality, integrity, or availability of Data or that constitutes a violation or imminent threat of violation of any Technical Requirement in respect of Data security, integrity, privacy or retention.

“Indemnified Party” means each MBTA Entity and each MBTA Person.

“Independent Certifier” has the meaning specified in Section 6.8(A) and includes any assignee or replacement consultant (or firm of consultants) appointed by the Parties pursuant to this Project Agreement and the Independent Certifier Agreement.

“Independent Certifier Agreement” means the agreement to be entered into between the Parties and the Independent Certifier pursuant to Section 6.8.

“Independent Evaluator” has the meaning specified in Appendix 8 (Payment Mechanism).

“Independent Handback Consultant” has the meaning specified in Section 2.3 of Appendix 9 (Handback Requirements).

“Independent Payment Consultant” has the meaning specified in Section 6.3 of Appendix 8 (Payment Mechanism).

“Index Linked” means, with respect to any amount so indicated hereunder, that the amount is adjusted as of each July 1 commencing July 1, 2018 by:

- (1) Multiplying it by the Inflation Index for the immediately preceding December;
- and
- (2) Dividing it by 241.432, the Inflation Index for December 2016.

“Inflation Index” means the All Items Consumer Price Index for All Urban Consumers (CPI-U) in US City Average (BES Series ID CUUR0000SA0) as published by the Bureau of Labor Statistics using a reference year of 1982-84 that equals 100.0 or, if such index in its present form becomes unavailable, such similar index as may be agreed by the Parties, acting reasonably. If such index is revised so that the base year differs from that set forth above, the Inflation Index shall be converted in accordance with the conversion factor published by the United States Department of Labor, Bureau of Labor Statistics. If the Bureau of Labor Statistics otherwise alters its method of calculating such index, the Parties shall mutually determine appropriate adjustments in the affected index.

“Information Security Plan” has the meaning specified in Appendix 3.1.

“Initial Term” has the meaning specified in Section 3.1(A).

“Inspect” or **“Inspection”** means the act of determining whether a Credential is valid and usable by a User to access Transportation Services in accordance with Fare Policy.

“Inspected” means, in the context of a Credential, that an Inspection occurred.

“Inspection Device” means the Device specified in Appendix 2.7 used to determine whether a Credential is valid and usable by a User to access Transportation Services.

“Inspection Device User” means the persons, as designated by the MBTA, permitted to use an Inspection Device to perform Inspections or Validations and perform other actions as specified in Appendix 2.7.

“Installation” means any site preparation work, installation of any System Element at or on any Location or Vehicle (including Device installation) or removal of any AFC 1.0 Equipment from any Location or Vehicle, including the addition of any System Element to, and any alteration of, any AFC 1.0 Equipment at or on any Location or Vehicle.

“Installation Commencement Date” has the meaning specified in Section 6.11(C).

“Insurance Broker” means the Systems Integrator’s insurance broker; provided that at all times such broker shall be a reputable international insurance broker in good standing.

“Insurance Condition” means any term or condition required to be in a policy of Required Insurance hereunder, excluding the coverage of any risk.

“Insurance Cost Decrease” means the Insurance Cost Differential if the value thereof is less than zero, multiplied by minus one.

“Insurance Cost Differential” means, subject to Section 17.7, the amount determined as follows:

$$\text{Insurance Cost Differential} = (\text{ABIC}-\text{BBIC}) - \text{PIC}$$

Where:

“ABIC” means the Actual Benchmarked Insurance Cost;

“BBIC” means the Base Benchmarked Insurance Cost; and

“PIC” means any Project Insurance Change.

“Insurance Cost Increase” means the Insurance Cost Differential if the value is greater than zero.

“Insurance Requirement” means any rule, regulation, code, or requirement issued by any insurer that has issued a policy of Required Insurance under this Project Agreement, as in effect during the Term, compliance with which is a condition to the effectiveness of such policy.

“Insurance Review Period” means:

(1) In respect of the first Insurance Review Period, the two-year period commencing on the Revenue Service Commencement Date and ending on the day immediately prior to the second anniversary thereof; and

(2) Thereafter, each subsequent two-year period commencing on each even-numbered anniversary of the Revenue Service Commencement Date and ending on the day immediately prior to the second anniversary of the date of commencement of each such two-year period; provided that:

If the end of any such Insurance Review Period would occur beyond the Term, then such Insurance Review Period shall end on the last day of the Term.

“In-System Refund” means the restoration of all or a portion of a Product in an Account to its original unused state.

“Integrated Service” or **“Integrated Services”** means those Transportation Activities which are offered by one or more Third Parties under current or future MBTA business opportunities or operating models.

“Intellectual Property” or **“Intellectual Property Right”** or **“IPR”** means any and all current and future legal and equitable rights and interests in or to know-how, Patent Rights, copyrights (registered or unregistered, and including moral rights), trademarks (registered and unregistered), service marks, trade secrets, designs (registered and unregistered), utility models, circuit layouts, plant varieties, business and domain names, inventions, solutions embodied in technology (including Software) and other intellectual activity and applications of or for any of the foregoing.

“Intermodal Transfer Station” means any Station where a User may transfer from one Mode of transportation to another.

“IVR” means the interactive voice response system to be developed, implemented, updated and maintained by the Systems Integrator as a System Element in support of the Customer Support Software, as more particularly described in Appendix 3.8.

“Joint Fare” means a single Fare paid for a Trip that includes use of the Transportation Services of the MBTA and one or more Regional Transit Provider(s).

“Joint Insurance Cost Report” has the meaning specified in Section 17.7(B).

“Joint Technical Review” has the meaning specified in Section 5 of Appendix 8 (Payment Mechanism).

“Joint Transaction Cost Report” has the meaning specified in Section 6.4 of Appendix 8 (Payment Mechanism).

“Key Accessibility Criteria” has the meaning specified in Appendix 2.9.

“Key Financial Events” has the meaning specified in Section 3.1 of Appendix 14 (Financial Close Procedures and Conditions).

“Key Milestone” means each of the Installation Commencement Date, the completion dates for each of Pilot Phase 1 and Pilot Phase 2, the Revenue Service Commencement Date, Transition Period Completion and the Full Service Commencement Date.

“Key Performance Area” means one of the defined combinations of Operating Services and System Elements set forth in Table 5 of Appendix 8 (Payment Mechanism).

“Key Performance Indicators” means the System Availability Standards and the Performance Standards.

“**Key Personnel**” has the meaning set forth in Appendix 10 (Key Personnel and Project Contractors).

“**Key Ratios**” means *[to be based on relevant ratios in the Financing Documents.]*

“**Legal Proceeding**” means every action, suit, litigation, arbitration, administrative proceeding, and other legal or equitable proceeding having a bearing upon this Project Agreement, and all appeals therefrom.

“**Lender**” means each of the holders and beneficiaries of Security Documents and their respective successors, assigns, participating parties, trustees and agents, including the Collateral Agent.

“**Lenders’ Liabilities**” means, at the relevant time, the aggregate of all amounts then due and payable by the Systems Integrator to the Lenders under the Financing Documents, including (without double counting and subject to Section 14.4):

(1) The then outstanding principal amount of debt funded under the Financing Documents; *plus*

(2) All capitalized and default interest accrued thereon, but with respect to default interest, only to the extent that it arises as a result of the MBTA making any payment later than the date that it is due under this Project Agreement; *plus*

(3) Customary banking fees, premiums or reimbursement obligations with respect to financial insurance policies, agent and trustee fees, costs and expenses properly incurred and owing or outstanding to the Lenders by the Systems Integrator under or pursuant to the Financing Documents on the Termination Date, including any prepayment costs, make-whole amounts or breakage costs; *plus*

(4) Any Hedging Liabilities; *minus*

(5) Any Hedging Receipts.

“**Lenders’ Remedies Agreement**” means the agreement between the MBTA, the Lenders and the Systems Integrator in the form set forth in Transaction Form B (Lenders’ Remedies Agreement).

“**Level 0 Data**” means Data which the SI and the System must ensure, in accordance with the Technical Requirements, is not retrievable by anyone.

“**Level 1 Data**” means Data which the SI and the System must ensure, in accordance with the Technical Requirements, can only be accessed by those persons possessing one of the pieces of information identified in Appendix 3.1A.

“**Level 2 Data**” means Data which the SI and the System must ensure, in accordance with the Technical Requirements, can only be accessed by those SI Persons and MBTA Persons meeting the criteria described in Appendix 3.1A and the access control requirements set forth in Appendix 3.1.

“**Level 3 Data**” means Data which the SI and the System must ensure, in accordance with the Technical Requirements, is only made available by the SI or the System to persons authorized by the MBTA, as described in Appendix 3.1A.

“Level 4 Data” means Data which is public, and which the SI and the System must manage and control to the extent required by Appendix 3.1A and otherwise in accordance with the Technical Requirements.

“Lien” means any and every lien against the Project or against any monies due or to become due from the MBTA to the Systems Integrator under this Project Agreement, for or on account of the Contract Services, including mechanics’, materialmen’s, laborers’ and lenders’ liens.

“Light Rail” means the segments of Rapid Transit provided via a light rail Vehicle or trolley Vehicle, including the Green Line and Mattapan Line.

“Light Rail Branch” means a specific route of Light Rail service, including the Boston College (B), Cleveland Circle (C), Riverside (D) and Heath Street (E) Branches.

“Limited-Functionality Fare Vending Machine” or **“Limited-Functionality FVM”** or **“Limited Functionality FVM”** means a Variant of FVM, as more particularly described in Appendix 2.3.

“Linked Account” has the meaning specified in Appendix 3.9.

“Liquidated Damage Right” has the meaning specified in Section 21.1(D).

“Location” means any Station, Stop or other area in or around the Transportation Network or on any public or private property where:

- (1) A Device is located;
- (2) A Device is required to be located hereunder, provided that in respect of any Expansion, only at such time as such Expansion is authorized hereunder; or
- (3) The Systems Integrator is required to perform Implementation Work.

The term “Location” includes the FVM Required Locations, the POS Required Locations, the Distributed Locations and any other Retail Reload Location, but does not include the Model Office, any other SI Location or Vehicles.

“Location Category” means, for a Location listed in Table 5 of Appendix 8 (Payment Mechanism), the category (A through D) in the header of the section of that table that lists the Location.

“Location Expansion” means an Expansion involving the SI’s provision of Devices for new or renovated Locations above and beyond the Devices required in respect of all Locations as they exist in the Transportation Network as of the Date of Award.

“Logged Failure Period” means, with respect to a Performance Failure, the period commencing at the Logged Failure Time and ending at the Logged Rectification Time, subject to Section 3 of Appendix 8 (Payment Mechanism).

“Logged Failure Time” means the time at which a Performance Failure is deemed to have commenced in accordance with Section 3 of Appendix 8 (Payment Mechanism).

“Logged Rectification Time” means the time when the Systems Integrator has effected a Rectification for a Performance Failure, as determined in accordance with Section 3 of Appendix 8 (Payment Mechanism).

“Longstop Date” means the outside deadline for the achievement of the Full Service Commencement Date, which is the date 12 months following the Scheduled Full Service Commencement Date, as such date may be adjusted pursuant to Article 13 (Supervening Events).

“Loss” means any loss, damage, injury, liability, obligation, cost, response cost, expense (including attorneys’, accountants’ and expert witnesses’ fees and expenses (including those incurred in connection with the enforcement of any indemnity or other provision of this Project Agreement)), fee, charge, judgment, penalty, fine or third party claims, including any injury to or death of persons, damage or loss of property, and harm or damage to natural resources.

“MassDOT” means the Massachusetts Department of Transportation.

“Maintenance Rectification Costs” means, in respect of any termination of this Project Agreement that occurs after the Full Service Commencement Date, all Losses that the MBTA determines it is reasonably likely to incur as a direct result of the termination of this Project Agreement, including (without double counting):

(1) Those costs (internal and external) that the MBTA is reasonably likely to incur as a direct result of carrying out any process to request bids or tenders from any parties interested in entering into a contract with the MBTA to carry out the Operating Services, including all costs related to the preparation of procurement documentation, evaluation of bids or tenders and negotiation and execution of relevant contracts; *plus*

(2) Those costs (internal and external) reasonably projected to be incurred by the MBTA in relation to:

(a) remediation or, if remediation is not possible or would cost more than renewal, renewal of any defective Contract Services; and

(b) rectification or cure of any breach of this Project Agreement by the Systems Integrator; *plus*

(3) Those costs (internal and external), reasonably projected to be incurred by the MBTA for the remainder of the Term (assuming the MBTA would exercise each of its renewal options) in order to ensure that the Project complies with the requirements of this Project Agreement, but only to the extent such projected costs exceed the costs assumed in the Financial Model if the Systems Integrator were to perform the Contract Services through the Expiration Date, discounted at the MBTA’s cost of capital for obligations of similar maturities as of the Termination Date; *minus*

(4) Any amounts standing to the credit of the Handback Reserve Account; *minus*

(5) Any amounts standing to the credit of the Physical Damage Proceeds Reserve that the MBTA is entitled to retain pursuant to Section 17.4(G)(2).

“Manual Retrieval” means the offline retrieval of Data from a Device by the Systems Integrator.

“Master Maintenance Plan” means the master maintenance plan to be prepared, updated and maintained by the Systems Integrator pursuant to Appendix 9 (Handback Requirements).

“Material Contract Party” means any party to a Material Contract other than the Systems Integrator.

“Material Contract Direct Agreement” means the agreement to be entered into among the MBTA, a Project Contractor or any other Material Contract Party which the MBTA determines shall enter into such an agreement, and the Systems Integrator in the form set forth in Transaction Form C. *[Note to Proposers: The MBTA reserves the right, based on its review of the Selected Proposer’s Proposal, to identify and require that entities other than the Project Contractors enter into a Material Contract Direct Agreement. Such entities may include material contract parties with a direct contractual relationship with the Systems Integrator, and will not include Subcontractors of any Project Contractor.]*

“Material Contracts” means:

- (1) The Project Contracts;
- (2) Any Merchant Agreement; and
- (3) Any agreement between the Systems Integrator and an Affiliate of the Systems Integrator for the performance of Contract Services.

“MBTA” means the Massachusetts Bay Transportation Authority, a body politic and corporate and a political subdivision of the Commonwealth, established under the provisions of the Act.

“MBTA Activities” means, collectively: (1) any activities carried on or to be carried on by the MBTA, or other persons permitted by the MBTA, in the Transportation Network related to the provision of public transportation services and any other lawful MBTA purpose during or after the Term, as permitted by the Act, and (2) Partnered Transportation Services. The term “MBTA Activities” expressly excludes tolling, congestion pricing, and any other activities that do not relate to Transportation Services (e.g., hotel rentals).

“MBTA Administrator” means an MBTA Person using an Administrator Account to perform MBTA Activities.

“MBTA Conditions Precedent” has the meaning specified in Section 2.2 of Appendix 14 (Financial Close Procedures and Conditions).

“MBTA Change” means any Change that the Systems Integrator is required to implement pursuant to Article 11 (Changes), subject to the exclusions set forth therein.

“MBTA Change Notice” has the meaning specified in Section 11.2(A).

“MBTA Discretionary Refund” means a Refund issued at the MBTA’s discretion and authorized by an MBTA Administrator, as further described in Appendix 4.4.

“MBTA Entity” means the Commonwealth, MassDOT, and the MBTA.

“MBTA Event of Default” has the meaning set forth in Section 23.1.

“MBTA Fare Gate Interface Controller Board” or “ICB” means a System Element which the SI must (1) manufacture to the MBTA specifications described in Appendix 2.3 and (2) use until Transition Period Completion as the interface between the System and any AFC 1.0 Equipment which is used by the SI to satisfy any Technical Requirement.

“MBTA Fare Revenue” means all revenue due from the Systems Integrator to the MBTA, as determined in accordance with Appendix 4.2 and excluding all amounts so determined in respect of any RTP.

“MBTA Fare Transactions” means those transactions referred to in Section 1.3 of Appendix 8 (Payment Mechanism).

“MBTA Fault” means:

- (1) A breach by the MBTA of any of its obligations under this Project Agreement;
- (2) A violation of Applicable Law by the MBTA;
- (3) A breach of any representation or warranty by the MBTA under this Project Agreement;
- (4) Willful misconduct of the MBTA or an MBTA Person; or
- (5) A negligent act or omission by the MBTA or an MBTA Person.

“MBTA Interface Control Document” means Documentation provided by the MBTA as Attachment 2 to Appendix 2.3 which specifies inputs and outputs for the MBTA Fare Gate Interface Controller Board.

“MBTA IPR” has the meaning specified in Section 16.5(A).

“MBTA Key Bus Routes” means the 15 busiest bus routes in the Transportation Network currently. Each MBTA Key Bus Route operates at a high frequency, 7 days a week, to meet passenger demand along high-density corridors. Service operates every 10 minutes or better during weekday peak periods, every 15 minutes or better during weekday midday, and every 20 minutes or better during off-peak periods. The 15 MBTA Key Bus Routes are: Routes 1, 15, 22, 23, 28, 32, 39, 57, 66, 71, 73, 77, 111, 116, and 117.

“MBTA Layer 2 Services” has the meaning specified in Appendix 2.5.

“MBTA Layer 2 Services Excess Amount” means the amount payable to the MBTA and calculated in accordance with Section 5.5.3 and 5.5.4 of Appendix 2.5.

“MBTA Layer 2 Services Fixed Amount” means \$16,000.

“MBTA Layer 2 Services Variable Amount” means \$65.

“MBTA Performance Failure Notice” has the meaning set forth in Section 3.4 of Appendix 8 (Payment Mechanism).

“MBTA Person” means any director, officer, member, employee, agent, representative, consultant, contractor or subcontractor of an MBTA Entity.

“MBTA Personnel Account” means an Account used by an MBTA Person in connection with the performance of MBTA Activities.

“MBTA-Provided Facility” has the meaning specified in Appendix 4.6.

“MBTA Representative” means any individual specified in writing by the MBTA pursuant to Section 25.3(A) as the representative of the MBTA from time to time for all purposes under this Project Agreement.

“MBTA Representative’s Final Decision” has the meaning specified in Section 20.1(C).

“MBTA Service Area” means the geographic area that encompasses the Transportation Network in eastern Massachusetts and Rhode Island.

“MBTA Service Failure” means a failure in the delivery of MBTA Transportation Services.

“MBTA Standard Non-Disclosure Agreement” means the MBTA template non-disclosure agreement set forth as Transaction Form L.

“MBTA Step-In Action” has the meaning specified in Section 21.5(C).

“MBTA Trademarks” means any brand name, trademark, or service mark of an MBTA Entity which this Project Agreement or the MBTA identifies to the SI as subject to branding requirements.

“Media” means one or more physical items containing a Credential that may be used by a User to access Transportation Services, including a Fare Card, EMV Card, NFC Device, Custom Fare Cards or wearable device.

“Mediator” means any person serving as a mediator of disputes pursuant to the Dispute Resolution Procedures.

“Merchant Agreement” has the meaning specified in Section 7.3(C).

“Milestone Conditions” means the conditions precedent for the achievement of a Key Milestone, as set forth in Appendix 5 (Milestone Conditions) and including, as applicable, the Criteria for Installation, the criteria for commencing and completing each phase of the Pilots, the Criteria for Revenue Service Commencement, the Criteria for Transition Period Completion and the Criteria for Full Service Commencement.

“Minimum Verizon Devices” means 5,000.

“Missing Tap” means a Tap that is not recorded by the System on a User's entrance into, Transfer from, or exit from a Mode of Transportation Services, whether through User mistake or System failure.

“MO Access Devices” means devices available in the Model Office to simulate User Interactions with Account Management Interfaces.

“**MO Non-Revenue Station**” means a station not used in Revenue Service with Devices installed, which is part of the Model Office, as further described in Appendix 2.4.

“**MO Physical Space**” has the meaning specified in Appendix 2.4.

“**Mobile Fare Card**” means a Credential equivalent to that used in the Fare Card and capable of being accepted by a Reader from a User's mobile NFC Device, as described in Appendix 2.6.

“**Mobile Model Office**” means a vehicle-borne space, which is part of the Model Office, as further described in Appendix 2.4.

“**Mode**” means any method of transportation offered by the MBTA or a Regional Transit Provider, including Rapid Transit, Light Rail, bus, Commuter Rail, or Ferry.

“**Model Office**” means a complete, accurate model version of the System for the purpose of simulating and testing System functions, including the MO Physical Space, the Mobile Model Office, the MO Non-Revenue Station, MO Access Devices, an API test environment, a satellite project office, and all System Elements and Contract Services required to fulfill the requirements of Appendix 2.4.

“**Monitoring Plan**” has the meaning specified in Appendix 4.6.

“**Month**” means calendar month.

“**Monthly Invoice**” has the meaning specified in Section 10.2(A).

“**Monthly Payment**” means a payment made or to be made from the MBTA to the Systems Integrator in an amount calculated in accordance with Appendix 8 (Payment Mechanism) and subject to Article 10 (Payments).

“**Monthly Performance Report**” means the report to be prepared by the Systems Integrator in accordance with Section 4 of Appendix 8 (Payment Mechanism) and submitted to the MBTA with each Monthly Invoice.

“**Moody's**” means Moody's Investors Service Inc. or any of its successors and assigns. If such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, “Moody's” shall be deemed to refer to any other nationally-recognized securities rating agency designated by the MBTA.

“**Mutual Authentication**” or “**Two-Way Authentication**” means two parties verifying each other at the same time through cryptographic techniques, and “**Mutually Authenticated**” shall be construed accordingly.

“**Net Lenders Liabilities**” means an amount equal to:

- (1) Lenders' Liabilities; *minus*
- (2) Systems Integrator Account Balances; *minus*
- (3) Termination Insurance Proceeds.

“**NFC Device**” means Media in the form of an electronic device owned or possessed by a User containing a near field communications (NFC) chip that enables communication and transfer of Data

by one- or two-way communication with another device containing an NFC chip, including, a smartphone, fob or card.

“No Better and No Worse” has the meaning specified in Section 14.6(D).

“Non-Binding Mediation” means the voluntary system of dispute resolution established under the Dispute Resolution Procedures for addressing disputes arising under this Project Agreement.

“Notice to Proceed” means a notice issued by the MBTA authorizing the Systems Integrator to commence performing a portion of the Contract Services, as specified in the Notice to Proceed.

“Obfuscate” means to mask Data by altering it in such a way that PII and other sensitive information is protected but data remains usable for the purposes of testing or reporting, as further described in Appendix 3.1A.

“Object Code” means Source Code translated or converted by a compiler into recognizable and executable machine language that a computer can execute directly or in assembly language.

“Offline Authentication” has the meaning specified in Appendix 3.4.

“Offline Data Authentication” or **“ODA”** means a process whereby a Payment Card is validated at the point of transaction, using RSA public key technology to protect against counterfeit or skimming. Three forms of offline data authentication are defined by EMV: Static (SDA), Dynamic (DDA) and Combined DDA/Application Cryptogram (CDA).

“Open Source Software” means Software for which the Source Code is available to the general public for use or modification from its original design free of charge, as well as Software that is subject to an open source license such as the GNU General Public License (GPL), GNU Lesser General Public License (LGPL), Affero General Public License, Mozilla Public License (MPL), BSD License, MIT License, Artistic License, or Apache License.

“Operating Day” means a portion of the Operating Times starting with the MBTA's first scheduled Transportation Services on a calendar day starting after 3:00 am, and ending upon the conclusion of the last operating Transportation Services (whether scheduled or not) which begin prior to 3:00 am on the following calendar day; Operating Days can therefore overlap and Transportation Services operating simultaneously may exist in different Operating Days.

“Operating Period” means the period commencing on the first day of Pilot Phase 1 and ending on the Termination Date.

“Operating Services” means everything required to be furnished and done for and relating to the operation and maintenance of the System by the Systems Integrator pursuant to this Project Agreement during the Operating Period.

“Operating Times” means those periods of time during which any Operating Services and System Elements making up a Key Performance Area are required to be made Available, as set forth in Table 1 of Appendix 8 (Payment Mechanism).

“Operating Services Manager” has the meaning specified in Section 7.1(B).

“Other AP Transaction Rate” means the corresponding rate shown in Table 7 of Appendix 8 (Payment Mechanism) which is used in calculating the portion of AP Transactions related to Fare Revenue for a Month, or a rate shown in Table 8 of Appendix 8 (Payment Mechanism) which is used in calculating the portion of AP Transactions related to Transaction Units occurring in a Month.

“Overdue Rate” means the maximum rate of interest permitted by the laws of the Commonwealth, if applicable, or the Prime Rate, whichever is lower during the period for which the calculation is to be made.

“Paid Area” means an area in a Station, at a Stop or on a Vehicle that, according to MBTA Fare Policy, may be entered by a person only after a Validation.

“Parties” means, collectively, the MBTA and the Systems Integrator, and **“Party”** means either the MBTA or the Systems Integrator.

“Partnered Transportation Services” means the provision of Transportation Activities that:

- (1) Are provided by:
 - (a) The MBTA and a Third Party (including, for example, RTAs, private transportation providers (e.g., Uber, Lyft)); or
 - (b) Only a Third Party, if such Third Party is under contract with the MBTA;
- (2) Rely on, or otherwise use, in whole or in part, the System; and
- (3) Take place within the Commonwealth or the MBTA's service areas outside of the Commonwealth (as the same may expand throughout the Term).

“Parts Storage Facilities” means storage space provided by the MBTA, as further described in Appendix 4.6.

“Pass Product” or **“Pass”** means a Product that entitles a User to take an undefined number of Trips (subject to Velocity controls and Anti-Passback Controls), over a Configured period of time and based on one or more other limiting characteristics, as set forth in Fare Policy.

“Patent Rights” means patents, patent applications, divisions, continuations, continuations-in-part, reissues, renewals, extensions, supplementary protection certificates, utility models, and the like of such patents and patent applications, and foreign counterparts and equivalents thereof.

“Pay API” means an Application Programming Interface which allows Integrated Services to request to use a linked Account to pay for a service, as further described in Appendix 3.9.

“PAYG Loss” means a declined Authorization of a monetary amount for an Authorization which was submitted in response to one or more accepted Taps of a Contactless EMV Credential at a Reader and for which the MBTA was not entitled to protection or recovery afforded to transit merchants through current or future payment transaction models of the applicable Payment Card Organization.

“Payment Application Data Security Standard” or “PA-DSS” means the standards and any Payment Industry Standards identified as such by the PCI Security Standards Council, and any successor standards.

“Payment Card” or “Bankcard” means a Payment Card Organization-branded credit or debit card used for payment of purchases in any Sales Channel, including such cards using a magnetic strip, contactless chip, contact chip and virtual cards such as a card payment application on an NFC Device.

“Payment Card Data” means any Data, including User Data, that relates to a bank-issued credit or debit card or is otherwise addressed and protected by the Payment Industry Standards.

“Payment Card Industry Data Security Standard” or “PCI-DSS” means the Payment Industry Standards identified as such by the PCI Security Standards Council, and any successor standards.

“Payment Card Industry PIN Transaction Security Point of Interaction” or “PCI-PTS” or “PCI-PTS POP” means all standards identified as such by the PCI Security Standards Council, and any successor standards.

“Payment Card Organization” means companies such as Visa, MasterCard, Discover Financial Services and American Express, which own and operate systems for the international processing of Bankcard payments, establish relationships with financial institutions for the issuance of Bankcards bearing the company’s brand, maintain standards and rules for Bankcard issuers and Payment Service Providers and which facilitate and promote the use of the company’s brand as an indicator of acceptance at retail merchants.

“Payment Industry Standards” means:

- (1) The Payment Card Industry Data Security Standards (PCI-DSS) established from time to time by the PCI Security Council;
- (2) Any other PCI Security Council standard determined to be applicable by the QSA pursuant to Appendix 3.2;
- (3) All policies, procedures, guidelines and regulations established from time to time by any Payment Card Organization and applicable to any Media or the performance of the Contract Services;
- (4) All Applicable Law in respect of Media and related payment transactions; and
- (5) The Reader Standards.

“Payment Processing Requirements” has the meaning specified in Section 6.2.2 of Appendix 8 (Payment Mechanism).

“Payment Service Provider” or “Payment Services Provider” has the meaning specified in Appendix 4.7.

“PCB” means a printed circuit board.

“PCI Security Standards Council” or **“PCI-SSC”** means the Payment Card Industry Security Standards Council and any successor organization.

“Peak Operating Times” means any Operating Time in which the MBTA is operating Transportation Services at a frequency greater than or equal to scheduled frequencies between 6:30 AM and 9:00 AM, and 3:30 PM and 6:30 PM, inclusive of Special Events, and can vary by Mode or route.

“Pedestrian Network” means the network of sidewalks and other pedestrian paths including those within Stations, parks, and private properties, excluding areas such as highways that lack pedestrian facilities.

“Penalty Fare” means an additional charge made to a User over and above a Fare imposed by Fare Policy based on the misuse of a Credential.

“Performance Deduction” means a Deduction resulting from a Performance Failure, as calculated in accordance with Section 3 of Appendix 8 (Payment Mechanism).

“Performance Failure” means a failure by the Systems Integrator to provide the Contract Services in accordance with a Performance Standard, commencing, counted, and concluding as provided in Section 3 of Appendix 8 (Payment Mechanism).

“Performance Failure Deduction Amount” or **“PFDA”** means, with respect to a Performance Failure, the applicable Deduction amount per Recurrence Period as set forth Table 4 of Appendix 8 (Payment Mechanism), subject to Section 3 of Appendix 8 (Payment Mechanism) including in respect of any Performance Impact Ratchet.

“Performance Failure Level” means, for a Performance Failure, a designation of the degree of adverse impact on the MBTA as provided in Table 3 of Appendix 8 (Payment Mechanism), based on one or more attributes of the Performance Failure or in light of overall adverse impact on the MBTA of other Performance Failures in respect of the same Performance Standard.

“Performance Impact Ratchet” means the factor, as provided in Table 3 of Appendix 8 (Payment Mechanism), by which a Performance Deduction is increased based on the Performance Failure Level.

“Performance Standard” means a standard provided in Table 3 of Appendix 8 (Payment Mechanism).

“Performance Tracking System” or **“PTS”** means the performance tracking and management system to be implemented by the Systems Integrator in order to record, action, track and process MBTA Performance Failure Notices and to supplement the functions of the AMS in monitoring the System and the performance of the Contract Services in accordance with Appendix 4.6.

“Permitted Encumbrances” means, as of any particular time, any one or more of the following:

- (1) Encumbrances created pursuant to the Security Documents in accordance with the terms and conditions of this Project Agreement;
- (2) Encumbrances for utility charges, taxes, rates and assessments not yet delinquent or, if delinquent, the validity of which is being contested diligently and in good faith by the

Systems Integrator and against which the Systems Integrator has established appropriate reserves in accordance with GAAP;

(3) Any encumbrance arising out of any judgment rendered which is being contested diligently and in good faith by the Systems Integrator, the execution of which has been stayed or against which a bond or bonds in the aggregate principal amount equal to such judgments shall have been posted with a financially-sound insurer and which does not have a material and adverse effect on the ability of the Systems Integrator to perform the Contract Services;

(4) Any encumbrance arising in the ordinary course of business imposed by law dealing with materialmen's, mechanics', workmen's, repairmen's, warehousemen's, landlords', vendors' or carriers' encumbrances created by law, or deposits or pledges which are not yet due or, if due, the validity of which is being contested diligently and in good faith by the Systems Integrator and against which the Systems Integrator has established appropriate reserves;

(5) Servitudes, licenses, easements, encumbrances, restrictions, rights-of-way and rights in the nature of easements or similar charges which shall not in the aggregate materially and adversely impair the performance of the Contract Services;

(6) Applicable zoning and building bylaws and ordinances, municipal bylaws and regulations, and restrictive covenants, which do not materially interfere with the performance of the Contract Services;

(7) Encumbrances which are created on or before the Effective Date;

(8) Encumbrances which are created by a Change in Law on or after the Effective Date; and

(9) Any encumbrance created by an act or omission by any Governmental Body or with respect to which the MBTA has given its consent.

“Personal Information” or **“Personally Identifiable Information”** or **“PII”** means any information or Data that identifies an individual or relates to an identifiable individual, including Level 0 Data, Level 1 Data, Level 2 Data, and name, date of birth, social security number, driver's license number or other identifying government issued number, financial account numbers (including credit and debit card numbers), home address, physical address, telephone number, zip code, e-mail address, company or organization affiliation, and associated interests.

“Personnel” means with respect to either Party or an RTP, such Party's or RTP's directors, officers, employees, temporary employees, consultants and contractors.

“Physical Damage Proceeds” has the meaning specified in Section 17.3(E).

“Physical Damage Proceeds Reserve” has the meaning specified in Section 17.4(E).

“Pilot” means the System testing described in Appendix 5 (Milestone Conditions), which involves a controlled group of Users interacting with the System in Revenue Service but which does not place the System in Revenue Service for the general public.

“Pilot Phase 1” means a small-scale rollout of a small portion of System Elements to a group of friendly Users designed to demonstrate System compliance in actual use conditions, as further described in Appendix 5.3.

“Pilot Phase 2” means a rollout of System Elements to a limited number of Users designed to demonstrate the SI’s operating and maintenance capabilities and confirm the transition approach, as further described in Appendix 5.3.

“Planned Expansion” means all the Expansions identified as Planned Expansions in Appendix 2.8.

“Point of Sale” or **“POS”** means a Fare Vending Machine or Retail Reload Location at which Users may pay for Fares or Products with cash, credit or debit. The term “Point of Sale” excludes Administrative Point of Sale.

“POS Required Location” has the meaning specified in Appendix 2.10.

“Preliminary DB Plans and Specifications” means the preliminary plans and specifications for the performance of the DB Installation Work prepared in accordance with Appendix 2.13 and delivered with the Systems Integrator’s Proposal.

“Preliminary Design Review” means the second of three stages of Design Review, as further described in Appendix 7 (MBTA Review Procedures).

“Preliminary Equity IRR” means [__]%. *[the Equity IRR as of the Effective Date based on the Preliminary Financial Model].*

“Preliminary Financial Model” means the financial model delivered by the Systems Integrator to the MBTA in connection with the Effective Date and set forth in Appendix 15 (Preliminary Financial Model), and substantially the same as that submitted by the Systems Integrator with the Proposal in accordance with Section 2.7.3.2 of the RFP.

“Preventative Maintenance Plan” means the Systems Integrator's plan and process for preventative maintenance more particularly described in Appendix 4.6.

“Pre-Refinancing Equity IRR” means the Equity IRR calculated immediately prior to the Refinancing but without taking into account the effect of the Refinancing on a version of the Financial Model updated for the actual revenue and cost performance of the Project up to the Refinancing date.

“Primary Account Number” or **“PAN”** has the meaning understood in Good Industry Practice based on Payment Industry Standards.

“Prime Rate” means the prime rate as published in The Wall Street Journal (Eastern Edition), or a mutually agreeable alternative source of the prime rate if it is no longer published in The Wall Street Journal (Eastern Edition) or the method of computation thereof is substantially modified.

“Privacy Laws” means, without limitation in respect of Applicable Law:

- (1) All applicable international, federal, and state laws, rules, regulations, executive orders, directives and other governmental requirements currently in effect and as they become

effective relating in any way to the privacy, confidentiality or security of Personal Information and Personally Identifiable Information, including:

- (a) The Gramm-Leach-Bliley Act (“GLBA”), 15 U.S.C. § § 6801-6827, and all regulations implementing GLBA;
 - (b) The Fair Credit Reporting Act (“FCRA”), 15 U.S.C. § 1681 et seq., as amended by the Fair and Accurate Credit Transactions Act (“FACTA”), and all regulations implementing the FCRA and FACTA;
 - (c) The Controlling the Assault of Non-Solicited Pornography and Marketing Act (“CAN-SPAM”);
 - (d) The Children's Online Privacy Protection Act (“COPPA”), 15 U.S.C. §§ 6501-6505;
 - (e) The Driver Privacy Protection Act, 18 U.S.C. § 2721, et seq. (“DPPA”), information security breach notification laws;
 - (f) Laws imposing minimum information security requirements (such as M.G.L. 93H and 201 Mass. Code Reg. 17.00);
 - (g) Commonwealth of Massachusetts Executive Order 504 (“EO 504”);
 - (h) Laws requiring the secure disposal of records containing certain Personal Information; and
 - (i) All similar international, federal, provincial, state and local requirements; and
- (2) All applicable industry standards concerning privacy, data protection, confidentiality or information security, and any additional laws, regulations or standards set forth in Appendix 3.1.

“Problem” means any actual or reported failure of compliance with any Technical Requirement, as observed by the Systems Integrator, as detected by any monitoring System Element (including the Automated Monitoring Subsystem and the Supplemental Monitoring Process), as reported by a User, or as reported by the MBTA, including any alert generated by the System.

“Product” means a unit of sale of Fares or other entitlement to Transportation Services as established in Fare Policy or the fare policy of a Regional Transit Provider, including Pass Products, Best Value Products, and Trip-Based Products, but not including computed charges authorized using a Contactless EMV Credential.

“Profile” means the Data and Configuration relating to access control (as described in Appendix 3.1) for a particular User of the System, for purposes of allowing access to the Customer Support Software, System Website, or Fare Card Mobile Application.

“Project” means the System and the performance of the Contract Services.

“Project Agreement” means this Project Agreement, including all Appendices and amendments hereto.

“Project Contractor” means any party to a Project Contract other than the Systems Integrator.

“Project Contracts” means *[to be completed based on Proposal to refer to the contracts with the Lead Design and Installation Firm and the Lead Operating Firm, as such terms are defined in the RFP. The term does not include the DB Contract.]*

“Project Debt” means bona fide indebtedness (including subordinated indebtedness) for or in respect of funds borrowed or incurred (including bona fide indebtedness with respect to any financial insurance issued for funds borrowed) or for the value of goods or services rendered or received, the repayment of which has specified payment dates and is secured by one or more Security Documents; provided that Project Debt:

(1) Includes principal, capitalized interest, accrued interest, customary and reasonable lender, financial insurer, agent and trustee fees, costs, expenses and premiums with respect thereto, payment obligations under interest rate and inflation rate hedging agreements or other derivative facilities with respect thereto, reimbursement obligations with respect thereto, lease financing obligations, and Breakage Costs; and

(2) Excludes any:

(a) Indebtedness of the Systems Integrator or any shareholder, member, partner or joint venture member of the Systems Integrator that is secured by anything less than the entire SI Interest, such as indebtedness secured only by an assignment of economic interest in the Systems Integrator or of rights to cash flow or dividends from the Systems Integrator;

(b) Increase in indebtedness to the extent resulting from an agreement or other arrangement the Systems Integrator enters into or first becomes obligated to repay after it was aware (or should have been aware, with reasonable due diligence) of the occurrence or prospective occurrence of an event of termination under this Project Agreement, including the Systems Integrator’s receipt of a notice of termination for convenience and occurrence of an MBTA Event of Default of the type entitling the Systems Integrator to terminate this Project Agreement; and

(c) Indebtedness unless and until the Collateral Agent provides the MBTA with notice thereof and the related Funding Agreements and Security Documents in accordance with this Project Agreement.

“Project Insurance Change” means any net increase or net decrease in the Actual Benchmarked Insurance Cost relative to the Base Benchmarked Insurance Cost, arising from:

(1) The claims history or re-rating of the Systems Integrator or any Systems Integrator Person (other than any rerating due to the acts or omissions of the MBTA);

(2) The effect of any change in deductibles unless such change is attributable to circumstances generally prevailing in the Relevant Insurance Markets; and

(3) Any other issue or factor other than circumstances generally prevailing in the Relevant Insurance Markets,

with such amount to be expressed as a positive number in the event of a net increase and a negative number in the event of a net decrease for the purposes of determining the Insurance Cost Differential.

“Project Management Plans” means all plans required by the Technical Requirements to be prepared by the Systems Integrator in connection with the performance of the Contract Services, as accepted by the MBTA pursuant to this Project Agreement.

“Project Schedule” means the critical path method schedule for the performance of the Implementation Work to be developed by the Systems Integrator in accordance with Appendix 2 (Design and Implementation Requirements).

“Proposal” means the Systems Integrator’s proposal submitted in response to the RFP.

“Proposal Submittal Date” means the deadline for the submittal of financial proposals under the RFP.

“Proprietary Intellectual Property” means an Intellectual Property Right that meets the following two criteria: the Intellectual Property Right (i) is embodied in a System Element, and (ii) is owned by:

- (1) The Systems Integrator;
- (2) Project Contractors; or
- (3) Subcontractors.

“Proprietary Work Product” has the meaning set forth in Section 16.1(A).

“PSE/PPSE” has the meaning used in Good Industry Practice.

“Public Records Act” means Massachusetts Public Records Act, M.G.L. c. 66 § 10, as amended from time to time.

“Punch List” means any defects, deficiencies and items of outstanding work that would not materially interfere with or impair MBTA Activities or the performance of the Operating Services and can be rectified without material interference or impairment of the same.

“QA Documentation” means Documentation relating to:

- (1) the quality management plan;
- (2) manufacturing, software and hardware development methods and operations, and testing and examination to confirm quality assurance;
- (3) reliability standards, availability standards, and maintenance standards;
- (4) fabrication and delivery of Deliverables, to ensure that only conforming Deliverables are provided to the MBTA; and

(5) procedures and processes for Contract Services and DB Installation Work to ensure that they meet the applicable performance requirements, including KPIs.

The term “QA Documentation” includes all revisions and updates to the same.

“Qualified Commercial Bank” means a domestic or foreign commercial bank:

(1) Whose long term and short term debt has at least the following ratings by at least two of the three rating agencies listed below:

- (a) “A2” or higher by Moody’s;
- (b) “A” or higher by Standard & Poor’s;
- (c) and “A” or higher by Fitch; and

(2) In the case of a foreign commercial bank, which maintains a banking office, branch or agency in Boston, Massachusetts or New York, New York.

“Qualifying Change in Law” means:

- (1) A Discriminatory Change in Law;
- (2) A Change in Law that eliminates or limits the MBTA’s exemption from sales and use Taxes applicable to purchases by any Systems Integrator Person of materials and equipment that become components of the System; and
- (3) A Change in Law (other than a Discriminatory Change in Law) which reasonably requires a Capital Expenditure;

Which, in each case, was not foreseeable in accordance with Good Industry Practice prior to the Proposal Submittal Date.

“Qualifying Refinancing” means any Refinancing that will give rise to a Refinancing Gain that is not an Exempt Refinancing.

“Quality Assurance” or **“QA”** means the Systems Integrator’s plan for quality assurance and quality control in performing the Contract Services to be developed in accordance with the Technical Requirements.

“Quantity Standards” has the meaning specified in Appendix 2.10.

“Queuing Principle” means the method of establishing the placement requirements within and around Locations and Vehicles at which the Systems Integrator must provide Devices and Retail Reload Locations to meet User needs.

“Rapid Transit” means the portions of the Transportation Network that are comprised of the Blue, Green, Mattapan, Orange, Red and Silver Lines.

“Rating Service” means Moody’s, Standard & Poor’s, Fitch, Kroll Bond Rating Agency or DBRS, Inc.

“**RCRA**” means the Resource Conservation and Recovery Act, 42 U.S.C.A. 6901 et seq.

“**Reader**” means a Device located in a Gate, in a Validator or in another host device (as described in Appendix 2.8 and Appendix 3.2) that interacts with a User Credential stored on Media to process a Tap, to generate Fare Data, and for other purposes as set forth in the Technical Requirements.

“**Reader API**” means an Application Programming Interface which allows devices and software not provided by the SI to use a Reader provided by the SI, as further described in Appendix 3.9.

“**Reader Expansion**” means an Expansion involving the SI’s provision of additional Readers for use in non-SI devices.

“**Reader Standards**” means the standards and requirements for Readers so identified in Appendix 3.2.

“**Reconciliation**” has the meaning specified in Section 13.6(A).

“**Rectification**” or “**Rectify**” or “**Rectified**” means, with respect to a Performance Failure, completion of rectification measures such that the relevant Operating Services are being performed and System Elements are Available in respect of the applicable Performance Standard.

“**Recurrence Period**” means, with respect to a Performance Failure, a period, as specified in Table 4 of Appendix 8 (Payment Mechanism), subject to Section 3 of Appendix 8 (Payment Mechanism), commencing when the Systems Integrator has failed to Rectify the Performance Failure within the applicable Cure Period or prior to the expiry of the immediately preceding Recurrence Period, as applicable.

“**Reduced Fare Group**” means any group of Users entitled to reduced Fares as set forth in Fare Policy, which may include seniors, persons with disabilities, and students.

“**Reference Documents**” means those documents listed as Reference Documents in the Table of Contents.

“**Refinancing**” means:

(1) Any amendment, or variation (other than an amendment or variation entered into solely to correct a manifest, clerical or other error), novation, extension, renewal, supplement, refunding, defeasance or replacement of any Project Debt, Funding Agreement or Security Document (other than any Equity Member Debt and Equity Member Funding Agreements);

(2) The issuance by the Systems Integrator of any indebtedness in addition to the initial Project Debt, secured or unsecured;

(3) The disposition of any rights or interests in, or the creation of any rights of participation in respect of, Project Debt, Funding Agreements and Security Documents (other than any Equity Member Debt and Equity Member Funding Agreements) or the creation or granting by the Systems Integrator or any Lender of any other form of benefit or interest in either Project Debt, Funding Agreements and Security Documents (other than any Equity Member Debt and Equity Member Funding Agreements) or the Systems Integrator’s Interest whether by way of security or otherwise; or

(4) Any other arrangement put in place by the Systems Integrator or another person which has an effect which is similar to any of items (1) through (3) above.

“Refinancing Gain” means an amount equal to the greater of zero and $[(A - B) - C]$, where:

A = the net present value, using the Base Case Equity IRR as the discounting rate, of the Distributions projected immediately prior to the Refinancing (taking into account the effect of the Refinancing and using the Financial Model as updated (including as to the performance of the Project up to the date of the Refinancing) so as to be current immediately prior to the Refinancing) to be made over the remaining Term following the Refinancing;

B = the net present value, using the Base Case Equity IRR as the discounting rate, of the Distributions projected immediately prior to the Refinancing (but without taking into account the effect of the Refinancing and using the Financial Model as updated (including as to the performance of the Project) so as to be current immediately prior to the Refinancing) to be made over the remaining Term following the Refinancing; and

C = any adjustment required to raise the Pre-Refinancing Equity IRR to the Base Case Equity IRR (if the Pre-Refinancing Equity IRR is lower than the Base Case Equity IRR, the adjustment is calculated as the amount that, if received by Equity Members at the estimated date of the Refinancing, would increase the Pre-Refinancing Equity IRR to be the same as the Base Case Equity IRR).

“Refund” means an In-System Refund or a Direct Refund allowed by Fare Policy, Configuration, MBTA approval of an MBTA Discretionary Refund, or allowable chargeback.

“Regional Transit Provider” means any entity providing transportation services to the public, including regional transit authorities, that is designated by the MBTA for expansion of the System in accordance with Article 12 (Expansion to Regional Transit Providers).

“Registered Account” means an Account registered to a User by name or other identifying information, as further described in Appendix 3.8.

“Registered User” means a User of a Registered Account, as further described in Appendix 3.8.

“Regulated Condition” means, and is limited to,

(1) Surface or subsurface structures, materials, properties or conditions having historical, cultural, archaeological, religious or similar significance;

(2) Any habitat of an endangered or protected species as provided in Applicable Law;

(3) The presence anywhere in, on or under the Locations on the Effective Date of wells or underground storage tanks for the storage of chemicals or petroleum products;

(4) The presence of Hazardous Substances in, on or under the Locations, including presence in surface water, groundwater, soils or subsurface strata; and

(5) Any fact, circumstance or condition constituting a violation of, or reasonably

likely to result in any loss, liability, forfeiture, obligation, damage, fine, penalty, judgment, deposit, charge, assessment, Tax, cost or expense under or in connection with any Applicable Law pertaining to the environment;

In each case to the extent not disclosed in or reasonably inferable from the Background Information.

“Reinstatement Plan” has the meaning specified in Section 17.4(B).

“Reinstatement Work” has the meaning specified in Section 17.3(D).

“Relevant Insurance Market” means the insurance markets which insure transportation related public-private partnerships or fare collections systems in the United States from time to time.

“Relevant Performance Standard” means the Performance Standard, if any, associated with each System Availability Standard referenced in Table 2 of Appendix 8 (Payment Mechanism).

“Relief Event” means and is limited to any of the following:

- (1) A Force Majeure Event;
- (2) A Change in Law that is not a Qualifying Change in Law;
- (3) Fire, explosion, earthquakes, riot and civil commotion;
- (4) Any weather event manifesting severe and historically unusual conditions directly affecting any part of a Location that is recognized as a severe local storm or flood event by the National Oceanic and Atmospheric Administration’s National Weather Service in a published notice, alert or warning and causes material and unavoidable damage to all or any material part of such Location or causes a shutdown of all or any part of the Transportation Network;
- (5) An unreasonable delay by a Governmental Body in the issuance of a Governmental Approval that is required to be obtained by any Systems Integrator Person following the submittal by such Systems Integrator Person of complete application materials for such Governmental Approval in accordance with Applicable Law and the administrative practices of the Governmental Body;
- (6) A failure of any MBTA-Provided Facility, as and to the extent provided in Appendix 4.6;
- (7) The interruption in the supply of Utilities necessary for the performance of the Contract Services (excluding MBTA-Provided Facilities and the Communications Network) to the extent beyond the reasonable control of the Systems Integrator and affecting a Location and properties adjacent to the Location;
- (8) The denial of access to a Location by MBTA Personnel, as and to the extent provided in Appendix 4.6;
- (9) Solely in respect of the Quantity Standards relating to Points of Sale, the bankruptcy of a major retail partner providing multiple Retail Reload Locations; and

(10) After the Full Service Commencement Date, any damage to the System to the extent such damage:

(a) Is caused by any event (excluding Vandalism) in respect of which (i) the MBTA maintains property insurance or (ii) public transit agencies in the United States would normally be expected to maintain property insurance (as determined by reference to Good Industry Practice), in each case, regardless of any deductible or self-insured retention; and

(b) Is not the result of any willful or negligent act, error or omission, failure to exercise reasonable diligence, or breach of this Project Agreement on the part of any Systems Integrator Person, including any Systems Integrator Fault;

In each case, subject to all terms and conditions of Article 13 (Supervening Events).

“Relief Request Notice” has the meaning set forth in Section 13.2(B).

“Remediable Breach” has the meaning specified in Section 22.2(A).

“Remedial Change” has the meaning specified in Section 11.5(B).

“Remediation Plan” means any plan prepared by or on behalf of the Systems Integrator, including all related Documentation, for corrective actions in respect of Defects, Problems, Incidents or any non-compliance with the requirements of this Project Agreement.

“Renewal Term” has the meaning set forth in Section 3.1(B).

“Reporting Failure Factor” means 1.5.

“Required Insurance” means the insurance specified in Appendix 12 (Insurance Requirements).

“Requisite Deposit Materials” has the meaning specified in Section 16.4(B).

“Reserve Bank” means a domestic or foreign commercial bank:

(1) Whose long term and short term debt has at least the following ratings by at least two of the three rating agencies listed below:

- (a) “A2” or higher by Moody’s;
- (b) “A” or higher by Standard & Poor’s;
- (c) and “A” or higher by Fitch; and

(2) Which maintains a banking office, branch or agency in Boston, Massachusetts.

“Residual Element” has the meaning specified in Section 2.1.2 of Appendix 9 (Handback Requirements).

“Residual Element Condition Report” has the meaning specified in Section 2.6 of Appendix 9 (Handback Requirements).

“Response Action” means any action taken in the investigation, removal, confinement, remediation or cleanup of a release of any Hazardous Substance, or to otherwise correct any non-compliance with Applicable Law pertaining to the environment or address any environmental condition as may be required by any relevant Governmental Body. “Response Action” includes any action which constitutes a “removal”, “response”, or “remedial action” as defined by section 101 of the CERCLA.

“Restricted Person” means any person who (or any member of a group of persons acting together, any one of which):

(1) Is disbarred, suspended, or otherwise disqualified from federal, Commonwealth, or MBTA contracting for any services similar in nature to the Implementation Work or the Operating Services;

(2) Was or is subject to any material claim of the United States, Commonwealth or MBTA in any proceedings (including regulatory proceedings) which have been concluded or are pending at the time at which the determination of whether the person falls within this definition is being made, and which (in respect of any such pending claim, if it were to be successful) would, in the MBTA’s view, in either case, be reasonably likely to materially and adversely affect the ability of the Systems Integrator to perform its obligations under this Project Agreement;

(3) In the case of an individual, he or she (or in the case of a legal entity, any of the members of the board of directors or its senior executive managers) has been sentenced to imprisonment or otherwise given a custodial sentence for any criminal offense (other than minor traffic offences or misdemeanors) less than five years prior to the date at which the determination of whether the person falls within this definition is being made;

(4) Has, directly or indirectly, its principal or controlling office in a country that is subject to any economic or political sanctions imposed by the United States for reasons other than its trade or economic policies;

(5) Has as its primary business the illegal manufacture, sale, distribution or promotion of narcotic substances or arms, or is or has been involved in terrorism; or

(6) Has as its primary business the acquisition of distressed assets or investments in companies or organizations which are or are believed to be insolvent or in a financial standstill situation or potentially insolvent.

“Retail Reload Location” means a POS Required Location or a Distributed Location used to meet the Quantity Standards in which Users may acquire Fare Cards, purchase Stored Value Products, and pay Enablement Fees, and excluding any such Location where the means of enabling such functionality is through a Fare Vending Machine.

“Revenue Impact” means, in respect of any Compensation Event, any amounts that would have been paid to the Systems Integrator pursuant to Article 10 (Payments) had it not been for the occurrence of such Compensation Event.

“Revenue Apportionment” means the allocation of Fare Revenue for Trips between or among the MBTA and one or more Regional Transit Providers.

“Revenue Service” means the period of time during which the Transportation Network or any part thereof, including any Vehicle or Station, or the System is open to the public for Transportation Services.

“Revenue Service Commencement Date” has the meaning specified in Section 6.11(E).

“RFP” means the MBTA’s Request for Proposals for Automated Fare Collections System Services, issued on November 15, 2016, as amended.

“Root Cause” means the initiating cause or fundamental reason for a failure of a System Element.

“RTP Contract” has the meaning specified in Section 12.3(A).

“RTP Fare Revenue” means the portion of Fare Revenue apportioned to any RTP.

“Sales Channels” means the System Elements and processes through which Products can be purchased inclusive of Fare Vending Machines, the Retail Reload Locations, the System Website, Customer Support Software, Administrative Point of Sales, the Fare Card Mobile Application, and all corresponding APIs.

“Scheduled Full Service Commencement Date” means the date which is 1,137 days following the Financial Close Deadline, as such date may be adjusted in accordance with Article 13 (Supervening Events).

“Scheduled Transition Period Completion Date” means the date which is 864 days following the Financial Close Deadline, as such date may be adjusted in accordance with Article 13 (Supervening Events).

“Second Handback Reserve Amount” has the meaning specified in Section 8.5(A).

“Second Stage Work” means the Implementation Work described in Appendix 2.3 in Section 8.6 for each Gate installed pursuant to Gate Option 2 or 3 and in Section 8.7 for each Gate installed pursuant to Gate Option 4.

“Security Documents” means the documents identified as such in the Lenders’ Remedies Agreement and executed on or about Financial Close to evidence senior Project Debt, together with any other documents designated as such by the Parties in accordance with the terms and conditions of this Project Agreement.

“Segment” means a User’s travel from one place to another on a single Mode of Transportation Services, where such travel is a part of a Trip as defined in Fare Policy.

“Settlement” means the process of managing electronic payment transactions so they can clear and be funded to the merchant's bank account. Settlements happen as a result of successful Authorizations. This typically consists of closing and transmitting a batch of authorized Payment Card transactions from a pre-defined period of time. Before a batch is settled, changes can be made to existing transactions in the batch. Once a batch is settled, the transaction totals from the batch can be compiled and reviewed by the merchant.

“SI Change Request” has the meaning specified in Section 11.5(B).

“SI Installation Work” has the meaning specified in Section 6.4(A).

“SI Interest” means all right, title and interest of the Systems Integrator in, to, under or derived from this Project Agreement, including the Systems Integrator’s right, title and interest in and to the Material Contracts, Subcontracts, Deliverables, claims and Intellectual Property.

“SI Interface Control Document” means Documentation of Device assemblies and subassemblies provided by the SI, as further described in Appendix 2.3.

“SI Location” has the meaning specified in Section 5.11(I).

“SI Project Manager” has the meaning specified in Section 6.4(E).

“SI Software” means Software that meets the following two criteria: the Software (i) is used or necessary for the operation or maintenance (including Updates and Upgrades) of, or other activities regarding, the System or any System Element (either during or after the Term, as applicable) and (ii) is owned by:

- (1) The Systems Integrator;
- (2) Project Contractors; or
- (3) Subcontractors.

The term “SI Software” includes, as applicable: (a) the Fare Card Mobile Application; (b) Software related to the System Website; (c) COTS Software and Open Source Software used in connection with the System; and (d) all Updates and Upgrades to SI Software.

“SI System Element” means any System Element or Deliverable (including SI Software) to the extent that System Element or Deliverable embodies an Intellectual Property Right owned by:

- (1) The Systems Integrator;
- (2) Project Contractors; or
- (3) Subcontractors.

The term “SI System Element” (a) expressly includes all Updates and Upgrades to such System Element or Deliverable, as applicable, and (b) expressly excludes Third Party System Elements.

“Software” means code that regulates and controls the operation of computer-based and microprocessor-based systems, including data transmission, by specifying computer programs, procedures, and rules. The term "Software" includes all application Software, communications software, operating system software, firmware, database and database management systems software and all other software and firmware, compilers, and library routines, in compiled, executable (Object Code) form as well as Source Code form where applicable. For the avoidance of doubt, the term “Software” includes COTS Software and Open Source Software.

“Software Documentation” means technical manuals, user manuals, specifications, handbooks, architecture diagrams, data flow and work-flow diagrams, and related materials that describe the use, functionality, operation, structure and other characteristics of the System Software. The term

"Software Documentation" includes all revisions and updates to the same, and all associated Software Release Notes.

"Software Escrow" has the meaning specified in Section 16.4(A).

"Software Release Notes" means Documentation relating to an Update or Upgrade that includes, at a minimum: (1) a description of changes; (2) affected equipment and modules; (3) Software modules updated by the release, including file names, version numbers, sizes, and checksums; (4) a list of all defects corrected, including references to MBTA correspondence where applicable; (5) a list of all features tested; (6) a list of all new features included; (7) copies of all test procedures and test results documentation; (8) complete installation instructions, including steps to verify proper installation and steps to remove the updated Software; (9) complete build instructions; (10) a list of Software tools used; and (11) back out procedures if the new Software fails to update or load.

"Source Code" means the human-readable form of programming code (i.e., code that may be printed out or displayed in a form readable and understandable by a programmer of ordinary skill) of the applicable Software application, all programming and systems documentation relating thereto, all flow charts and schematics that constitute the detailed design specifications for such application, all software and other instructions necessary to convert such code into the executable Object Code form of the Software application, and all materials, including design documentation, procedure library documentation and object standards and compilers or other Software that may be necessary or useful for modifying such code.

"Special Event" means a Regular Event or an Exceptional Event as described in Appendix 8 (Payment Mechanism).

"Standard & Poor's" means Standard & Poor's Rating Service, a division of The McGraw-Hill Companies, Inc., or any of its successors and assigns. If such corporation shall be dissolved or liquidated or shall no longer perform the functions of a securities rating agency, "Standard & Poor's" shall be deemed to refer to any other nationally-recognized securities rating agency designated by the MBTA.

"Standard Fare Card" means a closed-loop Media usable only on the System, which satisfies all of the Technical Requirements for a Fare Card, as further described in Appendix 2.6.

"Standard Work Product" has the meaning specified in Section 16.1(F).

"Station" means a Stop with a platform and which may include stairs, elevators, escalators, canopies, wind shelters, lighting, signs, buildings with a waiting room, Devices, restrooms, or concessions.

"Station Validator" means a Variant of a Validator intended for use at Stations, as more particularly described in Appendix 2.3.

"Step-In Period" means that period of time during which the MBTA is taking any MBTA Step-In Action pursuant to Section 21.5(C).

"Stop" means a User boarding or alighting facility included in the Transportation Network.

“Stored Value” or **“Stored Value Product”** means a Product whose value may be applied toward Fares for Trips.

“Subcontract” means any contract entered into by a Project Contractor or the Systems Integrator (except Project Contracts), or a subcontractor of any tier, with one or more persons in connection with the carrying out of the Systems Integrator’s obligations under this Project Agreement, whether for the furnishing of labor, materials, equipment, supplies, services or otherwise.

“Subcontractor” means any person that enters into a Subcontract other than the Systems Integrator or a Project Contractor.

“Subcontractor Breakage Costs” means Losses that have been or will be reasonably and properly incurred by the Systems Integrator under a Project Contract as a direct result of the termination of this Project Agreement (and which shall not include lost profit or lost opportunity), but only to the extent that:

- (1) The Losses are incurred in connection with the Project and in respect of the Contract Services required to be provided or carried out, including:
 - (a) Any materials or goods ordered or subcontracts placed that cannot be cancelled without such Losses being incurred,
 - (b) Any expenditure incurred in anticipation of the provision of services or the completion of Contract Services in the future, and
 - (c) The cost of demobilization including the cost of any relocation of equipment used in connection with the Project;
- (2) The Losses are incurred under arrangements and/or agreements that are consistent with terms that have been entered into in the ordinary course of business and on an arm's length basis; and
- (3) The Systems Integrator and the relevant Project Contractor have each used all reasonable efforts to mitigate such Losses.

“Submittal” or **“CDRL”** has the meaning specified in Appendix 7 (MBTA Review Procedures).

“Supervening Event” means, collectively, any Compensation Event and any Relief Event.

“Supplemental Monitoring Process” or **“SMP”** means the Operating Services and System Elements used to fulfill the requirements described in Appendix 4.6 for the portions of the System and the Contract Services which are not monitored by the Automated Monitoring Subsystem.

“Surface Light Rail” means the portion of Light Rail operated at the same level as the ground, as opposed to inside tunnels or along elevated structures.

“Surface Station” means a Station at which Users board or alight a Vehicle above ground.

“System” means the new automated, account-based open fare collections system, including all System Elements and Expansions, to be designed, installed, integrated, commissioned and tested by the Systems Integrator pursuant to this Project Agreement, as further described herein.

“System APIs” means all APIs that relate to System Elements or the System as a whole, the APIs described in Appendix 3.9 and the External Interfaces.

“System Availability Deduction” means a Deduction resulting from a System Availability Failure, calculated in accordance with Appendix 8 (Payment Mechanism).

“System Availability Failure” means a failure of the SI to perform or provide any part of the Operating Services or make Available one or more System Elements relative to a System Availability Standard which, based on the calculation methodology set forth in Appendix 8 (Payment Mechanism), results in a System Impact Multiplier other than 0% for such System Availability Standard for a Month.

“System Availability Standard” means a standard provided in Table 2 of Appendix 8 (Payment Mechanism).

“System Condition Report” has the meaning specified in Appendix 8 (Payment Mechanism).

“System Data Output” means the output generated by the System based on any Data input into the System. By way of clarification, and not limitation, the term “System Data Output” includes all tables, database schema, reports, charts, analytics and statistical analyses generated or used by the System.

“System Documentation” means any and all Documentation that the Systems Integrator is obligated to develop or provide pursuant to this Project Agreement, including:

- (1) Documentation concerning the design of the System, including contract drawings, CDRL Deliverables and Submittals, and samples and demonstrations submitted during Design Review;
- (2) Documentation (including Software Documentation) concerning SI System Elements and Third Party System Elements;
- (3) SI Interface Control Documents;
- (4) QA Documentation;
- (5) Documentation concerning training the Systems Integrator is to provide the MBTA under this Project Agreement;
- (6) Documentation concerning testing relating to the System and System Elements under this Project Agreement, including Documentation that constitutes, evidences, or relates to test plans, Test Cases, Use Cases, user acceptance testing (“UAT”), acceptance criteria, UAT exit criteria, testing certifications and other certifications, system integration testing, API testing, pilot testing, test methods, test results, and related materials;

(7) Documentation concerning System APIs, including the structure, format, grammar, definition, protocol and specification of the API; and

(8) Updates and Upgrades, where applicable, to such System Documentation.

“System Element” means any physical or electronic component of the System or upon which the System relies to operate in accordance with the Technical Requirements, including any Device, Software, Front-End System Element, Back-End System Element, CN Equipment, equipment, hardware, Test Tool, API, database, network, hosted service, fasteners, wiring, framing, tools, the System Website, the Customer Support Software, and other materials used to install, operate, or maintain the System.

“System Element Grouping” means the individual System Element or group of System Elements as applied specifically for the purposes of assessing System Availability Deductions and Performance Deductions and as identified in Table 4 of Appendix 8 (Payment Mechanism).

“System Impact Multiplier” or **“SIM”** means the percentage that will be used to calculate the monthly System Availability Deduction for a System Availability Standard, determined as set forth in Section 2 of Appendix 8 (Payment Mechanism).

“System Software” means :

- (1) SI Software; and
- (2) Third Party Software.

For the avoidance of doubt, it is agreed and understood that any and all Software that is used or necessary for the operation or maintenance (including Updates and Upgrades) of, or other activities regarding, the System or any System Element (either during or after the Term, as applicable) is either (a) SI Software or (b) Third Party Software.

“System Validation Equipment” means the Vehicle Validators required for installation and operation on a particular Vehicle, and all System Elements upon which such Vehicle Validators rely, to be installed on such Vehicle or to operate in accordance with the Technical Requirements.

“System Website” means the website by which Customers are able to perform Account management functions online, as set forth in Appendix 3.8.

“Systems Integrator” or **“SI”** means [____], a [____] organized and existing under the laws of [____], and its permitted successors and assigns.

“Systems Integrator Account Balances” means in respect of each bank account or trust account held by or on the behalf of the Systems Integrator (excluding the Handback Reserve Account, the Vandalism Reserve Account, the Unplanned Expansion Reserve, the Physical Damage Proceeds Reserve and the External Interfaces Reserve).

(1) The balance of such account; plus

(2) To the extent a letter of credit has been issued in partial or full substitution for any amount otherwise required to stand to the credit of any such account pursuant to the Financing Documents, the undrawn principal amount of such letter of credit;

in each case as of the Termination Date.

“Systems Integrator Conditions Precedent” has the meaning specified in Section 2.1 of Appendix 14 (Financial Close Procedures and Conditions).

“Systems Integrator Event of Default” has the meaning specified in Section 22.1(A).

“Systems Integrator Fault” means:

- (1) A breach by the Systems Integrator of any of its obligations under this Project Agreement;
- (2) A breach of any representation or warranty made by the Systems Integrator under this Project Agreement;
- (3) Willful misconduct of any Systems Integrator Person; or
- (4) A negligent act or omission of any Systems Integrator Person.

“Systems Integrator Hazardous Substances” means the presence of Hazardous Substances in, on or under the Locations, which is caused by or attributable to any acts or omissions of any Systems Integrator Person.

“Systems Integrator Performance Failure Notice” has the meaning set forth in Section 3 of Appendix 8 (Payment Mechanism).

“Systems Integrator Person” or **“SI Person”** means:

- (1) The Systems Integrator and any Equity Member, Project Contractor and Subcontractor;
- (2) Any other person (excluding the MBTA and the DB Entity) performing Contract Services for or on behalf of the Systems Integrator;
- (3) Any other person (excluding the MBTA and the DB Entity) for whom the Systems Integrator may be legally or contractually responsible; and
- (4) Any director, officer, employee, agent, representative, consultant, advisor (including any legal and financial advisor), successor or assign of any of the foregoing.

“Systems Integrator Representative” means any individual specified in writing by the Systems Integrator pursuant to Section 25.3(A) as the representative of the Systems Integrator from time to time for all purposes under this Project Agreement.

“Tap” means the action whereby a User causes Media containing a Credential to interact with the System via a Reader, or the equivalent event created as defined in Appendix 3.9, and the System's response to that action.

“Tax” means, from time to time, all taxes, surtaxes, duties, levies, imposts, rates, payments, assessments, withholdings, dues and other charges of any nature imposed by any Governmental Body, together with all fines, interest, penalties on or in respect of, or in lieu of or for non-collection.

“Technical Requirements” means the requirements for the design, implementation installation, integration, testing, operations and maintenance of the System, as set forth in Appendix 2 (Design and Implementation Requirements), Appendix 3 (Systems Functionality Requirements), Appendix 4 (Operations and Maintenance Requirements), Appendix 5 (Milestone Conditions) and Appendix 6 (Proposal Extracts – Technical Information).

“Temporary Fare Card” means closed-loop Media usable only on the System, dispensed from a Limited-Functionality Fare Vending Machine if such machine is not capable of dispensing Standard Fare Cards, as further described in Appendix 2.6.

“Term” means the Initial Term and any Renewal Term, subject to Section 3.1.

“Terminal” means the end of a specific route, branch or service of the Transportation Network.

“Termination Amount” means the measure of compensation owing from the MBTA to the Systems Integrator upon termination of this Project Agreement prior to the stated expiration of the Term, as set forth in Appendix 13 (Termination Compensation).

“Termination by Court Ruling” means the issuance of a final, non-appealable court order by a court of competent jurisdiction:

(1) To the effect that this Project Agreement is void, unenforceable or impossible to perform in its entirety, except where void, unenforceable or impossible to perform by reason of Systems Integrator Fault; or

(2) Upholding the binding effect on the Systems Integrator or the MBTA of a Change in Law that causes impossibility of performance of a fundamental obligation by the Systems Integrator or the MBTA under this Project Agreement or impossibility of exercising a fundamental right of the Systems Integrator or the MBTA under this Project Agreement.

“Termination Date” means the earlier of the Expiration Date or the date of early termination of this Project Agreement pursuant to Article 24 (Termination).

“Termination Deduction Amount” means any accrued monthly Deductions that, as of the Termination Date, have not been taken into account in the calculation of any payment actually made to the Systems Integrator by the MBTA prior to the Termination Date.

“Termination for Convenience” has the meaning specified in Section 24.2(A).

“Termination Insurance Proceeds” means all amounts that the Systems Integrator is (or pursuant to Section 17.1(F) should be) entitled to recover under the Available Insurance on or after the Termination Date, excluding proceeds of personal injury, property damage or other third-party liability insurance payable to or for the account of a third party.

“Test Case” means Documentation describing the conditions under which a tester will complete tests to confirm compliance with all requirements, as further described in Appendix 2.16.

“Test Plans” means Documentation describing test activities, methodologies and measurements of success, as further described in Appendix 2.16.

“Test Tool” means the tools, test Software, issue trackers, test benches, hardware and other materials necessary or useful for purposes of testing activities required by this Project Agreement.

“Third Party” means any person or entity other than:

- (1) The MBTA;
- (2) The Systems Integrator;
- (3) Project Contractors; or
- (4) Subcontractors.

“Third Party IP Claim” has the meaning specified in Section 16.6(A)(1).

“Third Party Software” means Software that meets the following two criteria: the Software (i) is used or necessary for the operation or maintenance (including Updates and Upgrades) of, or other activities regarding, the System or any System Element (either during or after the Term, as applicable) and (ii) is not owned by:

- (1) The Systems Integrator;
- (2) Project Contractors; or
- (3) Subcontractors.

The term “Third Party Software” includes, as applicable: (a) the Fare Card Mobile Application; (b) Software related to the System Website; (c) COTS Software and Open Source Software used in connection with the System; and (d) all Updates and Upgrades to Third Party Software.

“Third Party System Element” means any System Element or Deliverable (including Third Party Software) to the extent the System Element or Deliverable embodies an Intellectual Property Right that is not owned by:

- (1) The Systems Integrator;
- (2) Project Contractors; or
- (3) Subcontractors.

The term “Third Party System Element” (i) expressly includes all Updates and Upgrades to such System Element or Deliverable, as applicable, and (ii) expressly excludes SI System Elements.

“Title VI Report” means the MBTA's most recently submitted triennial report to show compliance with Title VI of the Civil Rights Act of 1964.

“Total Active Verizon Accounts” means the total number of unique Verizon wireless devices active during the Month.

“Total AP Transaction Rate” means the total of the Allowable AP Transaction Rate and the Other AP Transaction Rate, as shown in Table 7 of Appendix 8 (Payment Mechanism), which is used in calculating the portion of AP Transactions related to Fare Revenue for a Month, or a rate shown in

Table 8 of Appendix 8 (Payment Mechanism) which is used in calculating the portion of AP Transactions related to Transaction Units occurring in a Month.

“Total Compliant Hours” means: i) In the context of a System Availability Standard, the number of hours and fractions thereof in a Month during which the listed System Elements (and all portions thereof) fully complied with the System Availability Standard; or ii) In the context of a Pilot standard, the number of hours and fractions thereof in a thirty (30) day period during which the listed System Elements (and all portions thereof) fully complied with the Pilot standard.

Any hour (rounded up) during which even a momentary failure of compliance occurred (including, for the avoidance of doubt, anything that would be considered a “bug” by Good Industry Practice), regardless of any applicable Cure Period for any related Performance Failure shall be excluded from Total Compliant Hours, except for failures for which the root cause was Vandalism.

“Total MBTA Layer 2 Service Locations” means the total number of stations, garages, or carhouses utilizing the MBTA Layer 2 Services in the Month.

“Total Potential Hours of Availability” means, for a System Element, the total number of hours and fractional hours occurring in the Month during the Operating Times applicable to such System Element, less the total number of hours and fractional hours of preventative maintenance duly scheduled and performed in accordance with the Technical Requirements.

“Transaction Channel” means the payment method through which a portion of Fare Revenue or a Transaction Unit occurs in the System, from among the lists in Table 7 and Table 8 of Appendix 8 (Payment Mechanism).

“Transaction Form” means any of the Transaction Forms appended to this Project Agreement and identified as such in the Table of Contents.

“Transaction Payment Review Process” has the meaning set forth in Appendix 8 (Payment Mechanism).

“Transaction Review Period” means the portion of the Operating Period following the later of the Revenue Service Commencement Date and the date of completion of the most recent Transaction Payment Review Process.

“Transaction Unit” means a unit of counting certain events that occur in the System, are associated with a Transaction Channel, and meet the criteria set forth in Table 8 of Appendix 8 (Payment Mechanism).

“Transfer” means a User's act, in the course of a single Trip as defined by Fare Policy, of moving from one Mode of Transportation Services to another or moving from one Vehicle to another within the same Mode.

“Transfer Restriction Date” has the meaning set forth in Section 15.1(A).

“Transition Period” means the period commencing on the Revenue Service Commencement Date and ending on Transition Period Completion, as such period may be extended pursuant to Section 6.12(A).

“Transition Period Completion” has the meaning specified in Section 6.11(F).

“Transition Period Completion Certificate” has the meaning specified in Section 6.11(F)(1).

“Transportation Activities” means all services relating to transporting a person or persons from one place to another (including services such as parking).

“Transportation Network” means, during any period, the Vehicles, Stations and other property and services operated and maintained by the MBTA or any MBTA Person to provide Transportation Services.

“Transportation Services” means all services provided in any area served by the MBTA to provide transport of a person or persons from one place to another over the Transportation Network, including services provided by persons under contract with the MBTA.

“Trip” means a unit of travel by a User using Transportation Services; provided, that a Trip may consist of more than one Segment, as set forth in Fare Policy.

“Trip-Based Product” means a Product that grants a User an entitlement to take one or more Trips meeting certain criteria (including Mode, Zone, time of day, day of week, etc.) over a period of time.

“Unavailable Insurance Condition” means any Insurance Condition that, at the time a policy of Required Insurance is obtained or renewed, is:

(1) Notwithstanding the use of all reasonable efforts by the Systems Integrator and the absence of Systems Integrator Fault in respect of its insurance obligations hereunder, not available to the Systems Integrator in respect of the Project in the worldwide insurance or reinsurance markets on the terms required herein with reputable insurers of good standing; or

(2) Not generally being incorporated in insurance policies procured in the worldwide insurance or reinsurance markets with reputable insurers of good standing by contractors in relation to transportation-related infrastructure projects in North America similar to the Project due to the level of insurance premium payable for insurance incorporating such Insurance Condition.

“Ungated Station” means a Station at which a User need not pass through a Gate to access Transportation Services.

“Uninsurable Risk” means a risk for which:

(1) Notwithstanding the use of all reasonable efforts by the Systems Integrator and the absence of Systems Integrator Fault in respect of its insurance obligations hereunder, insurance anticipated under the Required Insurance is not available to the Systems Integrator in respect of the Project in the worldwide insurance or reinsurance markets on the terms required herein with reputable insurers of good standing; or

(2) The insurance premium payable for insuring that risk under the Required Insurance is at such a level that the risk is not generally being insured against in the worldwide insurance or reinsurance markets with reputable insurers of good standing by contractors or owners in relation to transportation-related infrastructure projects in North America similar to the Project.

“Unit Rate” means any of:

- (1) The hourly rates for work classifications specified in Attachment 11-A to Appendix 11 (Unit Rates and Change in Cost Methodology);
- (2) The unit costs associated with Devices, Readers and Retail Reload Locations, as set forth in Attachment 11-B to Appendix 11 (Unit Rates and Change in Cost Methodology); and
- (3) The unit price for Fare Cards specified in Attachment 11-C to Appendix 11 (Unit Rates and Change in Cost Methodology).

“Unplanned Expansion” means all Expansions which are not Planned Expansions.

“Unplanned Expansions Reserve” has the meaning specified in Section 11.4(C).

“Unregistered Account” means an Account that is not registered to a User by name or other identifying information, as further described in Appendix 3.8.

“Unregistered User” means a User of an Unregistered Account, as further described in Appendix 3.8.

“Update” means an error correction, bug fix, repair, or other change to a System Element that does not constitute a material change in functionality of that System Element or does not materially enhance the System Element. When used with respect to System Software, the term “Update” includes new software versions, which are typically identified by a change in the numeral to the right of the decimal point (e.g. a change from version 2.0 to 2.1). The term “Update” comprises all Updates used or necessary for use of the System in accordance with the Contract Standards (including both corrective and preventative maintenance, where applicable) and includes all Updates required under the Master Maintenance Plan.

“Upgrade” means a change to a System Element that adds material new functionality or materially enhances the System Element. When used with respect to System Software, the term “Upgrade” includes new software releases, which are typically identified by a change the numeral to the left of the decimal point (e.g., a change from version 2.0 to 3.0). The term “Upgrade” comprises all Upgrades used or necessary for use of the System in accordance with the Contract Standards, and includes all Upgrades required under the Master Maintenance Plan.

“Use Case” means Documentation describing a representative range of typical and atypical scenarios from the User’s and MBTA’s perspective as a sequence of User interactions with the System in accordance with all requirements specified herein.

“User” means any person who uses Transportation Services, who interacts with System Elements, or who accesses or is entitled to access the Paid Area of a Station via interaction with a Device, whether or not in exchange for payment of a Fare or purchase of a Fare.

“User Data” means Data collected from or relating to Users (including Registered Users and Alternates). The term “User Data” includes Personal Information as well as any Data held in Registered User accounts.

“User Established Customizations” means personalized preferences for User Interactions with the System.

“User Interaction” means any interaction between a User and the System, including Taps, transactions at Fare Vending Machines, interactions with Inspection Devices, and transactions in the System Website, Customer Support Software, or APIs.

“User Interface” means any part of a System Element used by a User to interact with the System or used by the System to communicate messages to a User. A User Interface may be comprised of physical, digital, audio and visual parts of System Elements, including any part of a Sales Channel which is visible to Customers and any operable part, display screen, label, placard, sign, light or sound of a Device.

“User Session” means a group of User Interactions by a single User aimed at completing a task, including making a purchase or taking a Trip. A User Session may contain multiple screen or page views, Taps or inputs. A User Session starts with the first User Interaction aimed at completing the task and ends either with successful completion of the task, failure or abandonment of the task or the time allowed for completion exceeded.

“Utilities” means any and all utility services and installations whatsoever (including gas, water, sewer, electricity, telephone, and telecommunications), and all piping, wiring, conduit, and other fixtures of every kind whatsoever related thereto or used in connection therewith.

“Validate” or **“Validation”** means the act, in accordance with Fare Policy, of effectuating a charge to an Account by consuming (permanently or temporarily) all or part of the Account Balance, including any Pass Product entitlement, Transfer entitlement, or by verifying and recording an entitlement for free travel in accordance with Fare Policy and Configuration.

“Validated” means, in the context of a Tap or other similar request for authorization, that Validation was successfully completed.

“Validator” means a Device located at Stops, Stations, or on Vehicles that performs a Validation and the functions more particularly described in Appendix 2.3.

“Value” means monetary value associated with an Account that can be used to access Transportation Services.

“Vandalism” means, and is limited to, willful and malicious damage to a System Element that is not capable of being repaired by means of minor repairs consistent with the Systems Integrator’s ordinary maintenance obligations hereunder and that is caused by a User or any person visiting the Project for any purpose. The Parties acknowledge and agree that Vandalism excludes:

- (1) Any Incident;
- (2) Unintentional damage caused by Users in accessing the Transportation Network, including damage through hard use of the System that should be anticipated under Good Industry Practice; and
- (3) Any damage that arises from or is contributed to, directly or indirectly, by any Systems Integrator Fault.

“Vandalism Reserve Account” has the meaning specified in Section 8.2(B).

“Vandalism Reserve Amount” has the meaning specified in Section 8.2(D).

“Variant” means a version of a Device that differs from any other versions to meet differing Technical Requirements or provide an Update or Upgrade.

“Vehicle” means any rolling stock used to provide Transportation Services, including buses, Light Rail, Rapid Transit, Commuter Rail and trolleys, where:

- (1) A Device is located;
- (2) A Device is required to be located hereunder, provided that in respect of any Expansion, only at such time as such Expansion is authorized hereunder; or
- (3) The Systems Integrator is required to perform Implementation Work.

“Vehicle Expansion” means an Expansion involving the SI’s provision and installation of Devices for newly acquired Vehicles above and beyond the Devices required for any Vehicles included in the Transportation Network as of the Date of Award.

“Vehicle Validator” means a Variant of a Validator intended for use on Vehicles, as more particularly described in Appendix 2.3.

“Velocity” means controls and checks on the rate at which a Credential is processed by the System.

“Verizon Credit Amount” means \$30,000.

“Verizon Monthly Service Fees” means the amounts payable to the MBTA in accordance with Section 4.6.6 of Appendix 2.5.

“Work Product” means any work product, document, drawing, specification, plan, application, data, process, formula, software, sketch, model, layout, algorithm, program, research, report, translation, schematic, pictorial or graphic work of any kind, and improvements to any of the foregoing, including all Documentation and Submittals, whether or not patentable or subject to copyright and including all intermediate or partial versions thereof, developed or created by any Systems Integrator Person either (1) pursuant to the Early Works Agreement after the Date of Award, or (2) under this Project Agreement after the Effective Date.

“Zone” means a group of Stations or Stops on one or more routes in the Transportation Network, usually sharing a common geographic property, and **“Zoned”** shall be construed accordingly.

APPENDIX 7

MBTA REVIEW PROCEDURES

1. Document Control System

The Systems Integrator shall establish and maintain a document tracking, reporting and control system (the “**Document Control System**” or “**DCS**”) in accordance with the Contract Standards to store and record all Work Product (subject to Article 16 (Intellectual Property) of the Project Agreement), correspondence, administrative documents and other documents generated under this Project Agreement. All correspondence between the Parties and their respective representatives with respect to the Project shall be categorized and serialized in a manner acceptable to the MBTA, acting reasonably. At a minimum, the Document Control System shall:

- 1.1 Be a secure, password protected, internet-based document sharing site capable of handling all Project documents;
- 1.2 Maintain and allow access to previous versions of documents;
- 1.3 Support multiple configurable security levels to limit access;
- 1.4 Compile and maintain a real-time register of the submission date, contents and status of each Submittal;
- 1.5 Provide access to the MBTA and its designated representatives on a real-time basis;
- 1.6 Be consistent with Good Industry Practice in all respects; and
- 1.7 Support the DB Entity’s use of the DCS to access files shared by the SI and/or the MBTA and to share files with the SI and/or the MBTA.

2. Submittals

Unless otherwise provided in this Project Agreement, in respect of any Work Product or proposed course of action on the part of the Systems Integrator which, under the terms of this Project Agreement, is required to be submitted to the MBTA for its review, comment, consent, acceptance, approval or like assent (each such Work Product or proposed course of action, a “**Submittal**”), the Systems Integrator shall:

- 2.1 Post each Submittal to the DCS;
- 2.2 Promptly submit such number of hard copies of each Submittal as may be required by the MBTA, acting reasonably;
- 2.3 Submit each Submittal in English;
- 2.4 Provide electronic versions of Submittals in accordance with Section 5.7(A) of the Project Agreement;
- 2.5 Unless specified in the master submittals list or otherwise agreed to in advance by the MBTA in its discretion, not combine a Submittal with any other Submittal;

- 2.6 Manage Submittals from Project Contractors and Subcontractors;
- 2.7 Include with each Submittal a cover sheet which includes:
 - 2.7.1 A unique Submittal tracking number, based on the ID number in the master submittals list;
 - 2.7.2 The date of the Submittal;
 - 2.7.3 A list of all documents, information and data included with, or required for interpretation of, the Submittal, including details of all attachments and other documents, information and data incorporated by reference;
 - 2.7.4 A description of the purpose of the Submittal, including reference to the relevant provision(s) of this Project Agreement pursuant to which it is being submitted;
 - 2.7.5 A detailed Submittal history, including:
 - 2.7.5.1 Submission dates in respect of any prior versions of the Submittal (if applicable);
 - 2.7.5.2 Revision number (if applicable);
 - 2.7.5.3 Identification of all revisions from previously submitted versions of the Submittal (if applicable);
 - 2.7.5.4 Name of the person (including individual and organization) that prepared the Submittal;
 - 2.7.5.5 Name of the person (including individual and organization) that performed the quality check in respect of the Submittal; and
 - 2.7.5.6 A comment resolution log containing all previous comments from the MBTA Representative and indicating how previous comments have been addressed in the latest Submittal version;
- 2.8 Cause each Submittal to include a signed and dated certification of the Systems Integrator in form and substance reasonably acceptable to the MBTA that such Submittal is complete, is suitable for the purpose for which it is being submitted and meets the requirements of the Project Agreement; and
- 2.9 Cause each Submittal (or the relevant parts of each Submittal) to be signed or sealed by persons with appropriate professional designations to the extent signing or sealing of the document is required by this Project Agreement, Applicable Law or Good Industry Practice.

3. Submittal Schedule

Without limiting any other obligation hereunder, the Systems Integrator shall, within thirty (30) days of the Effective Date, prepare, provide, update and maintain a schedule of all known or reasonably anticipated Submittals to be provided to the MBTA in accordance with this Project Agreement, which schedule shall, at a minimum:

- 3.1 Use the master Submittal list (Appendix 2.11 – Attachment 1) to identify all known or reasonably anticipated Submittals to be provided to the MBTA over the Term;
- 3.2 Refer to Submittals using the names and Submittal ID numbers on the master Submittals list (Appendix 2.11 – Attachment 1);
- 3.3 Indicate dates for delivery and review of each Submittal anticipated within the next six (6) months and indicate approximate timings for Submittals anticipated beyond six (6) months.
- 3.4 Provide for a progressive and orderly flow of all Submittals in respect of the design of the System or any change to the System; and

- 3.5 Provide for sufficient time for consideration of each Submittal by the MBTA and its designated representatives, taking into account the volume and complexity of the Submittals and the resources necessary to consider such Submittals and the requirements of this Project Agreement.

The Systems Integrator shall incorporate the Submittal schedule into the Submittal tracking tool use the master submittals list on the Document Control System as described in Appendix 2.11. The Systems Integrator shall provide the MBTA with updates to the Submittal schedule required under this Section 3 on a monthly basis. Each Submittal schedule, including each update or amendment thereto, shall be subject to the reasonable approval of the MBTA.

[CDRL: Submittal schedule]

4. Restrictions Prior to Review

The Systems Integrator shall not commence or permit the commencement of any work, including Implementation Work and Operating Services in respect of maintenance or changes to the System, that is the subject of, governed by or dependent upon a Submittal until such Submittal has been provided to the MBTA in accordance with this Project Agreement and:

- 4.1 In respect of any Submittal governed by Section 5 of this Appendix 7 (MBTA Review Procedures):
- 4.1.1 The MBTA has unconditionally consented to, accepted or approved the Submittal; or
 - 4.1.2 The MBTA has conditionally consented to, accepted or approved the Submittal, the Systems Integrator has agreed in writing to comply with or respond to, as applicable, all conditions related to such Submittal, and no further submission in respect of the Submittal is required under Section 9 of this Appendix 7 (MBTA Review Procedures); and
- 4.2 In respect of any Submittal governed by Section 6 of this Appendix 7 (MBTA Review Procedures):
- 4.2.1 The MBTA has unconditionally consented to, accepted or approved the Submittal;
 - 4.2.2 The MBTA has conditionally consented to, accepted or approved the Submittal, the Systems Integrator has agreed in writing to comply with or respond to, as applicable, all conditions related to such Submittal, and no further submission in respect of the Submittal is required under Section 9 of this Appendix 7 (MBTA Review Procedures); or
 - 4.2.3 The MBTA has failed to respond in any way to such Submittal within three Business Days of receiving written notice from the Systems Integrator that the MBTA's time period for a response, as determined in accordance with Section 8 of this Appendix 7 (MBTA Review Procedures), has expired.

5. Submittals Subject to Discretion of the MBTA

Where this Project Agreement specifies that any particular Submittal is subject to consent, acceptance, approval or like assent by the MBTA in its discretion:

- 5.1 The MBTA may make comments in relation to, or reject, such Submittal in its discretion in accordance with Section 1.2(N) of the Project Agreement;
- 5.2 The MBTA's discretionary right includes the right to refrain from giving, or to impose conditions on, such consent, acceptance, approval or like assent;
- 5.3 A failure of the MBTA to respond within any time period expressly provided for in this Project Agreement shall be deemed a rejection of the Submittal; and

- 5.4 The decision of the MBTA in respect of the Submittal, including any deemed rejection, shall be final and binding on the Parties and not subject to the Dispute Resolution Procedures.

6. Submittals Subject to Reasonableness Standard

Where this Project Agreement expressly provides that the MBTA is required to act reasonably in deciding whether to give its consent, acceptance, approval or like assent of or to any Submittal, the MBTA, acting reasonably, may make comments in relation to, reject, or impose conditions on its consent, acceptance, approval or like assent in respect of, such Submittal only to the extent that:

- 6.1 The Submittal:
- 6.1.1 Does not comply with, does not conform to, or is otherwise inconsistent with the requirements of this Project Agreement;
 - 6.1.2 Is inconsistent with, or conflicts with, the contents, requirements or procedures described in an earlier Submittal that has been accepted or to which the MBTA had no objection;
 - 6.1.3 Has not been prepared in accordance with, is inconsistent with or otherwise contradicts or conflicts with Good Industry Practice;
- 6.2 The Systems Integrator has not provided all information, data and documents required in respect of such Submittal;
- 6.3 The proposed Submittal or the adoption of the proposed document or proposed course of action is impractical or endangers public safety or security;
- 6.4 The adoption of the proposed document or proposed course of action would, or might reasonably be expected to:
- 6.4.1 Conflict or be inconsistent with the statutory, public or other duties or functions of the MBTA or the legal obligations of the MBTA;
 - 6.4.2 Give rise to a breach, or be in breach, of any Applicable Law;
 - 6.4.3 Materially and adversely affect:
 - 6.4.3.1 the ability of the Systems Integrator to perform its obligations under this Project Agreement;
 - 6.4.3.2 any right or obligation of the MBTA under this Project Agreement, or the ability of the MBTA to enforce any such right or to perform any of its obligations under this Project Agreement, or the ability of the MBTA or any other Governmental Body to carry out any statutory or public duty or function; or
 - 6.4.3.3 any right or obligation of the MBTA under or in respect of any Material Contract should the MBTA elect to enforce its rights under the applicable Material Contract Direct Agreement; or
- 6.5 The MBTA establishes any other reasonable ground for its determination in respect of the Submittal in writing.

Any dispute concerning a Submittal that is subject to this Section 6 shall be subject to the Dispute Resolution Procedures.

7. Submittals Subject to Design Review

Where this Project Agreement expressly provides that a Submittal or System Element is subject to Design Review, the SI shall work with the MBTA through an iterative process to develop, submit, review and improve the System design through Design Review in accordance with the requirements set forth in this

Section. The SI shall incorporate a formal Design Review process into its Project Management Plan (described in Appendix 2.11). Submittals subject to Design Review shall have review periods consistent with those described in Section 8 of this Appendix 7.

- 7.1 It is not necessary for all Submittals subject to Design Review to progress through each stage of the Design Review process at the same time. The SI may elect to run multiple streams of Design Review concurrently, provided that items with interdependencies are grouped together, including:
 - 7.1.1 Customer-Facing Devices: Gates, Validators and FVMs, including: (i) all Variants (ii) hardware, and (iii) User Interface.
 - 7.1.2 Customer-facing digital interfaces: System Website and if applicable, Fare Card Mobile Application.
 - 7.1.3 Administrator and Customer Support System tools: IVR and Administrator Interface and External Interface to the MBTA reduced fare eligibility tracking databases.
 - 7.1.4 Vehicle installation: mounting locations, design of wiring, materials tables, installation and removal plans.
 - 7.1.5 Inspection functionality: Inspection Devices and External Interface to the MBTA inspection violation tracking system.
 - 7.1.6 Station installation: all aspects of the DB Plans and Specifications.
- 7.2 Design Review shall include three stages: Conceptual Design Review, Preliminary Design Review and Final Design Review. Each stage in the process shall delve more deeply into detail to the point that both the MBTA and the SI have a comprehensive understanding of the required outcomes and the solutions proposed for achieving those outcomes.
 - 7.2.1 Conceptual Design Review. In the Conceptual Design Review stage, the SI shall present their vision for meeting MBTA requirements and identify key information and decisions required from the MBTA.
 - 7.2.1.1 Types of Submittals
Submittals for Conceptual Design Review may include:
 - 7.2.1.1.1 A description of the approach;
 - 7.2.1.1.2 Preliminary specifications for System Elements;
 - 7.2.1.1.3 A preliminary/summary plan;
 - 7.2.1.1.4 A sample subset of documentation; and
 - 7.2.1.1.5 Example(s) of a similar approach, with an explanation of what would change to meet the MBTA's requirements.
 - 7.2.1.2 Timing
For most System Elements, the conceptual design is required by Proposal Submittal Requirements (PSRs). Where a PSR has been submitted that provides a conceptual design, the Conceptual Design Review will begin following the Date of Award with the MBTA providing feedback on the Proposal Submittals; provided that the MBTA's review period shall be deemed to begin upon execution of the Early Works Agreement. Where a PSR is not identified in respect of a System Element, the Conceptual Design Review shall be identified on the SI's master schedule (as described in Appendix 2.11).
 - 7.2.1.3 Feedback
Within five (5) days following the Effective Date, the SI shall provide a template for Design Review feedback which includes MBTA comments, ID numbers, SI responses and the status of each item. Such template, upon acceptance by the MBTA (acting reasonably), will be utilized by the MBTA and the SI to compile and track feedback to designs at each stage of Design Review. Unless requested

by the MBTA or SI, each acting reasonably, Conceptual Design Review does not require a Design Review meeting. [CDRL: Template for Design Review feedback]

7.2.2 Preliminary Design Review. In the Preliminary Design Review stage, the SI shall deliver preliminary designs for MBTA review, incorporating any information, decisions or feedback provided by the MBTA pursuant to Conceptual Design Review.

7.2.2.1 Types of Submittals

Unless otherwise specified in the Technical Requirements, preliminary design may be on paper and does not require development of actual System Elements. Submittals for Preliminary Design Review may include:

- 7.2.2.1.1 Updated Submittals from the Conceptual Design Review;
- 7.2.2.1.2 Detailed drawings and documentation;
- 7.2.2.1.3 A visual design mockup, incorporating any applicable style guides;
- 7.2.2.1.4 Production of any required style guides;
- 7.2.2.1.5 Wireframes, demonstrating the functionality to be developed and
- 7.2.2.1.6 Diagrams, explaining relationships.

7.2.2.2 Timing

Preliminary Design Review dates shall be included in the SI's master Submittal schedule required pursuant to Section 3 of this Appendix 7 and shall be scheduled prior to development of any System Elements impacted by the design decisions.

7.2.2.3 Feedback

The preliminary design shall be accompanied by a summary of issues addressed pursuant to Conceptual Design Review. As described in Section 7.2.1.3, the SI shall provide and utilize a template for Design Review. The SI shall deliver preliminary designs, allow time for MBTA review (as described in Section 8 of this Appendix 7) and hold Design Review meetings with the MBTA to discuss feedback.

7.2.3 Final Design Review. In the Final Design Review stage, the SI shall deliver final designs for MBTA review, incorporating any feedback provided by the MBTA on the preliminary designs.

7.2.3.1 Types of Submittals

Submittals for Final Design Review shall show a design which is essentially complete and shall include, as applicable:

- 7.2.3.1.1 Updated Submittals from the Preliminary Design Review;
- 7.2.3.1.2 Detailed design specifications;
- 7.2.3.1.3 Prototype or model build; and
- 7.2.3.1.4 Samples of parts.

7.2.3.2 Timing.

Final Design Review dates shall be included in the SI's master Submittal schedule required pursuant to Section 3 of this Appendix 7.

7.2.3.3 Feedback.

The final design shall be accompanied by a summary of issues addressed pursuant to Preliminary Design Review. As described in Section 7.2.1.3, the SI shall provide and utilize a template for Design Review. The SI shall deliver final designs, allow time for MBTA review (as described in Section 8 of this Appendix 7) and hold Design Review meetings with the MBTA to discuss feedback.

7.2.3.4 Usability improvements

For any Design Review of a User Interface, the SI shall provide user testing reports (as described in Appendix 2.16) during the Final Design Review. The SI shall incorporate usability improvements based on the user testing into the revised version of designs.

7.2.3.5 Revised version of designs

The SI shall submit a revised version of the final designs which addresses MBTA feedback for MBTA approval, acting reasonably. The revised version of final designs may be waived if the SI and the MBTA mutually agree to do so.

7.2.3.6 Final design approval

Final designs shall be considered approved when the MBTA approves the revised version of the final designs or waives the requirement for the SI to revise the final designs as described in Section 7.2.3.3.

7.3 Design Modification Review. The SI shall make iterations, including changes to the User Interface, based on issues identified during functional and performance tests (described in Appendix 2.16), Accessibility review (described in Appendix 2.9)], and user testing (described in Appendix 2.16). Modifications of the final design shall be subject to a repeat of the Final Design Review.

8. Review Periods Available to the MBTA

Except where any provision of this Project Agreement expressly provides for a longer or shorter period for the MBTA to make a determination in respect of a Submittal, which longer or shorter period shall govern over any period established under this Section, the MBTA shall, as soon as practicable within a period of up to 15 Business Days following receipt of an accurate and complete Submittal in conformance with this Project Agreement, review and provide the Systems Integrator with a written determination from the MBTA Representative concerning the Submittal; provided that:

- 8.1 In the event of any failure of the Systems Integrator to comply with, or multiple Submittals not anticipated by, the Submittal schedule most recently approved by the MBTA in accordance with Section 3 of this Appendix, any period of review for a Submittal shall be extended to the extent reasonably necessary to account for the volume and complexity of the Submittals pending review by the MBTA and the resources necessary to consider each such Submittal;
- 8.2 Any period of review for a Submittal may be extended by mutual agreement of the Parties, acting reasonably; and
- 8.3 The failure of the MBTA to provide any such written determination shall have the consequences specified in Section 4.2.3 or Section 5.3 of this Appendix 7 (MBTA Review Procedures), as applicable, but shall not constitute MBTA Fault.

The MBTA's review period in respect of any re-submission of any Submittal shall, unless otherwise expressly provided in any other provision of this Project Agreement, be a reduced period of 10 Business Days; provided that, there shall be no such reduced period (and the period applicable for the original Submittal shall remain applicable for the re-submission) if the reason for the re-submission is that the original Submittal was not complete.

9. Systems Integrator Response

The Systems Integrator shall promptly respond to all comments and responses received from the MBTA on or to any Submittal, including by making modifications to such Submittal as necessary to fully reflect and resolve all such comments and responses; provided that, in respect of any Submittal governed by Section 6 of this Appendix 7, the MBTA has proper grounds for its comments and responses, as determined in accordance with such Section. After making any such modifications, to the extent reasonably required by the MBTA in accordance with this Appendix 7, the Systems Integrator shall resubmit such Submittal as many times as is necessary until the MBTA has either:

- 9.1 Unconditionally consented to, accepted or approved the Submittal in accordance with this Appendix 7; or
- 9.2 Notified the Systems Integrator that a re-submission is not required.

10. Limitations on MBTA Consent, Acceptance and Approval

The Systems Integrator may rely on a consent, acceptance, approval or like assent by the MBTA concerning any Submittal only for the limited purpose of establishing that the consent, acceptance, approval or like assent occurred. Except as otherwise expressly provided in this Project Agreement, no review, approval (including any consent, acceptance, approval or like assent in respect of any Submittal), inspection, examination, audit, testing, determination, certificate, certification, permission, oversight, comment or objection, or lack of any of the foregoing, by the MBTA or any MBTA Person shall in any case:

- 10.1 Constitute acceptance of any materials, work or any System Element as satisfying the requirements of this Project Agreement;
- 10.2 Relieve the Systems Integrator, or diminish the Systems Integrator's liability for, the performance of its obligations under this Project Agreement;
- 10.3 Create or impose any requirement, liability, covenant, agreement or obligation on the MBTA or any MBTA Person;
- 10.4 Prevent the MBTA from subsequently exercising any right under this Project Agreement without being bound by the manner in which the MBTA previously exercised (or refrained from exercising) such right; or
- 10.5 Constitute a waiver of any right of the MBTA or any MBTA Person under this Project Agreement or of any legal or equitable right of the MBTA or any MBTA Person.

APPENDIX 8

PAYMENT MECHANISM

This Appendix 8 sets forth how the Key Performance Indicators are calculated and used, how Monthly Payments are calculated, how and when to conduct reviews triggered by levels of success in respect of the Key Performance Indicators, and a method for how and when Allowable AP Transaction Rates may be adjusted.

Availability Payments

Monthly Payment Calculation

The amount of each Monthly Payment shall be calculated using the worksheet provided as Attachment 1 (“**Monthly Payment calculation worksheet**”) of this Appendix 8. The inputs to the worksheet shall be derived and calculated as set forth in this Appendix 8, including System Availability Multipliers and Performance Deductions. A completed worksheet shall be submitted by the Systems Integrator with each Monthly invoice as the basis for any Monthly Payment amount requested. The Monthly invoice shall be prepared in accordance with Section 7 of this Appendix 8 and shall equal the Monthly Payment contained in Line 78 of the applicable Monthly Payment calculation worksheet.

The instructions set forth in the worksheet provided as Attachment 1 are a part of this Project Agreement and binding on the Parties. In the event of any disagreement or uncertainty between the instructions written on the attached worksheet and any formulas in any electronic spreadsheet version of the worksheet, the written instructions will take precedence.

Failure to Accurately Report

Without limiting any other right of the MBTA hereunder, in the event that the Systems Integrator fails to accurately report any System Impact Multiplier or any Performance Failures in any completed Monthly Performance Report or Monthly Payment calculation worksheet included with any Monthly Invoice:

the MBTA will retroactively recalculate the applicable Deductions for the relevant Month and recalculate what would have been the Monthly Payment using the Monthly Payment calculation worksheet in accordance with this Appendix 8;

the MBTA may, in its discretion, also apply the Reporting Failure Factor to the calculation of the System Availability Deduction or Performance Deduction, as applicable, and advise the Systems Integrator of the result; and

the Systems Integrator shall include the difference between the originally calculated Monthly Payment and the recalculated Monthly Payment as an additional Deduction on the Monthly Payment calculation worksheet in respect of each subsequent Month until the difference is settled.

Any additional Deduction pursuant to this Section 1.2 shall not be subject to any cap on Deductions in the Month taken, but the cap on Deductions may apply to such recalculated Deductions for the relevant Month in respect of which the System Impact Multiplier, Performance Failure, or both, as applicable, should have been applied.

The Monthly Payments for each intervening Month between the Month when a retroactive Deduction was incurred and the current Month shall be recalculated to reflect the impact of the retroactive Deduction. Any adjustment required to the Earn Back figures resulting from this recalculation shall be reflected in the Monthly Payment calculation worksheet for the current Month.

For the avoidance of doubt, where Sections 1, 2, 3, and 4 and Tables 2 and 3, and Attachment 1, of this Appendix 8 refer to “Month”, it means the Month for which the Monthly Performance Report and any corresponding request for Monthly Payment are calculated, and all required worksheets, calculations, and content shall be prepared and completed for that same Month, regardless of the timing of submission of any Monthly Invoice.

Expansions

Any new Devices and Locations added to the System as part of a Planned Expansion or an Unplanned Expansion shall be considered to be incorporated into this Appendix 8 and its tables in accordance with the provisions of Appendix 2.8.

MBTA Fare Revenue

When computing the AP Transactions component based on MBTA Fare Revenue, only MBTA Fare Revenue as defined by this Project Agreement (including Appendix 4.2) shall be allocated among the Transaction Channels based on the allocations defined in Table 7 of this Appendix 8. For the avoidance of doubt, any amounts processed by the Systems Integrator other than the exact total MBTA Fare Revenue for the Month shall not be reflected in the calculations for AP Transactions nor allocated to a Transaction Channel on any submitted Monthly Payment calculation worksheet.

Start of Deductions

System Availability Deductions and Performance Deductions shall only be assessed from the Revenue Service Commencement Date. Prior to the Revenue Service Commencement Date the Systems Integrator is required to comply with the monitoring, reporting and other requirements of the Project Agreement, including all those necessary to demonstrate compliance with the Criteria for Revenue Service Commencement.

System Availability

System Availability Generally

Without limiting any other obligation of the Systems Integrator under this Project Agreement, the Systems Integrator shall, starting on the Revenue Service Commencement Date, comply with the System Availability Standards set forth in Table 2 of this Appendix 8.

Except as otherwise expressly provided in the Project Agreement, compliance with System Availability Standards shall be monitored, measured, collected and recorded on a twenty-four (24) hours-per-day, seven (7) days-a-week basis.

System Availability Deductions

For purposes of this Appendix 8, the Systems Integrator's compliance and performance against the System Availability Standards shall be measured on a Monthly basis. Any failure of the Systems Integrator to achieve a 0% System Impact Multiplier in respect of any System Availability Standard in a given Month shall constitute a System Availability Failure. Subject to this Section 2, the System Impact Multiplier for each Month for each System Availability Standard shall be determined using Table 2 of this Appendix 8 and used as shown in the worksheet provided as Attachment 1 (Monthly Payment calculation worksheet) of this Appendix 8 to determine any resulting System Availability Deduction.

Subject to Attachment 1 (Monthly Payment calculation worksheet), where an aspect of a Performance Failure also constitutes non-compliance with a System Availability Standard, the Logged Failure Period and any other impact of the Performance Failure concurrently counts as time or impact against compliance with the System Availability Standard, regardless of whether any Performance Deduction applied as a result of the Performance Failure.

Performance

Performance Failures Generally

Without limiting any other obligation of the Systems Integrator under this Project Agreement, the Systems Integrator shall, starting on the Revenue Service Commencement Date, comply with the Performance Standards as set out in Table 3 of this Appendix 8. In the event of any Performance Failure, the Systems Integrator shall take corrective action to effect a Rectification prior to expiration of any applicable Cure Period. If the Systems Integrator fails to effect a Rectification prior to expiration of any applicable Cure Period, a Performance Deduction shall apply in respect thereof, calculated as set forth in this Section 3.

Performance Deductions

When calculating the total Performance Deductions in respect of a Performance Standard for a Month, every Performance Failure occurring in the Month in respect of that Performance Standard shall be considered and:

if the entire Logged Failure Period fell within the Month, then the full result of the Performance Deduction calculation in this Section 3.2 shall count toward the total Performance Deductions; otherwise

the result of each iteration of the Performance Deduction calculation in this Section 3.2 for a Recurrence Period which ended in the Month shall count toward the total Performance Deductions.

Subject to Section 3.3 of this Appendix 8 and the exception identified in Section 3.2.3, if there is a Performance Failure, the Performance Deduction for that Performance Failure shall be calculated as follows:

$$PD_{z,x,s,[c],e} = PFDA_{s,[c]} \times \sum_{e=1} (PIR_{x,e})$$

Where:

$PD_{z,x,s,[c],e}$ is the Performance Deduction in respect of a Performance Failure (z) of Performance Standard (x) which occurs to a Unit (s), and if applicable to that Unit, a Location Category (c), covering the sum of Recurrence Period(s) (e)

$PFDA_{s,[c]}$ is the Performance Failure Deduction Amount for the Unit (s), and, if included, Location Category (c), found using in Table 4 of this Appendix 8

$PIR_{x,e}$ is the Performance Impact Ratchet found using Table 3 of this Appendix 8 for the particular Performance Standard (x) that occurred during the Recurrence Period (e), based on the highest Performance Failure Level which occurred during that Recurrence Period, based on the Performance Failure Levels shown in Table 3 of this Appendix 8

e occurs once for each Recurrence Period occurring after the expiry of the Cure Period

Where a Performance Failure is such that it can be classified as a failure to meet more than one (1) Performance Standard in respect of a Key Performance Area then the Performance Deductions in respect of that Performance Failure shall be calculated using the one (1) impacted Performance Standard as attracts the greatest Performance Deduction. This restriction does not limit the applicability of System Availability Deductions for all applicable System Availability Standards for which such a Performance Failure may concurrently result in noncompliance.

Commencement of and Counting Performance Failures

One (1) Performance Failure shall be considered to have occurred for each failure of compliance with a Performance Standard for each “Unit” identified in Table 4 of this Appendix 8 for the Key Performance Area and Location Category (if any) impacted by the failure of compliance with the Performance Standard.

For example, and for the avoidance of doubt:

If the Unit noted on Table 4 represents multiple Devices or products, such as a “Gate” or “Fare Card”, and if, say, three (3) Gates in a single Key Performance Area and Location Category (if any) fail to comply with a particular Performance Standard, whether the Logged Failure Periods overlap or not, then at least three (3) Performance Failures have occurred, one (1) for each Gate for each combination of Logged Failure Time and Logged Rectification Time.

If the Unit noted on Table 4 is singular, such as a “System” or “Project”, for a Key Performance Area and Location Category (if any) impacted by the failure of compliance with a Performance

Standard, then only one (1) Performance Failure occurs at one time in respect of that particular combination of Performance Standard, Key Performance Area, and Location Category (if any), even if additional aspects of the Key Performance Area are subsequently impacted prior to the Logged Rectification Time.

Determining Cure Period and Recurrence Period

The applicable Cure Period and Recurrence Period in respect of each Key Performance Area, and, if applicable, Location Category, shall be determined using Table 4 of this Appendix 8, except:

Where more than 60% of the Devices constituting a Key Performance Area at a Location identified in Table 5 of this Appendix 8 are subject to a Performance Failure on the same Operating Day, the Cure Period shall be reduced by 50% in respect of that Performance Failure and the Recurrence Period shall be reduced by 50% in respect of that Performance Failure;

Where more than 60% of the Devices constituting a Key Performance Area on a Vehicle are subject to a Performance Failure on the same Operating Day, the Cure Period shall be reduced by 50% in respect of that Performance Failure and the Recurrence Period shall be reduced by 50% in respect of that Performance Failure;

In respect of a Customer-Facing Device, if the Root Cause of a Performance Failure was the active insertion of foreign matter into an opening of a Device that is specifically required to exist in order to fulfill a Technical Requirement related to the User Interface of the Device (including a bill slot on an FVM), the Cure Period in respect of that Performance Failure shall be increased by 50%;

Subsequent failures of the same Performance Standard that occur in respect of the same Root Cause affecting the same Device of the relevant Key Performance Area on the same Operating Day shall be treated as a single Performance Failure such that no Cure Period shall be available in respect of the second such Performance Failure, and all subsequent Performance Failures in respect of the same Root Cause affecting the same Device of the relevant Key Performance Area, that occur during that Operating Day;

If the SI brings about a Rectification of a Performance Failure in part or whole by moving any System Element or subcomponent thereof from one Device to a second Device, or otherwise impairs the operation of the first Device, then the Cure Period for any Performance Failure impacting the Device from which the System Element or subcomponent was removed shall be zero;

To the extent that the Systems Integrator provides additional hardware maintenance or other requested resources pursuant to Section 3.11 of this Appendix 8 in respect of Exceptional Events, the Cure Periods for Performance Failures occurring at the applicable Locations for all Key Performance Areas will be reduced by 50% from the applicable Cure Periods as otherwise determined in accordance with Section 3.4 of this Appendix 8;

If a Performance Failure occurs in respect of Performance Standard 22 for a Limited-Functionality FVM, and the same Limited-Functionality FVM does not also have a Performance Failure in respect of Performance Standard 3, then the applicable Cure Period is 24 hours; and

As provided in Section 3.10 of this Appendix 8.

Determination of Logged Failure Time and Logged Failure Period

Subject to Sections 3.5.5, 3.5.6 and 3.5.7 of this Appendix 8, the Logged Failure Time in relation to any Performance Failure shall be the earliest of the time at which:

the AMS recorded the Performance Failure;

the Performance Failure was recorded by the Systems Integrator, or reasonably should have been identified and recorded by the Systems Integrator in accordance with Good Industry Practice and all other Contract Standards;

the MBTA Performance Failure Notice or the Systems Integrator Performance Failure Notice, as the case may be, was delivered to the PTS; or

the time when the Performance Failure actually began, if the PTS is not Available.

Exceptions to determination of Logged Failure Time and Logged Failure Period:

If a Performance Failure occurs entirely during non-Operating Times for a Key Performance Area (that is, the Logged Failure Time occurs during non-Operating Time for that Key Performance Area and the Logged Rectification Time occurs prior to the start of the next Operating Time for that Key Performance Area), then the Logged Failure Period shall be considered to be zero for that Performance Failure; provided that a Performance Deduction will apply to such a Performance Failure if the applicable Cure Period is also zero.

If a Performance Failure occurs during Operating Times in respect of a Customer-Facing Device, and the expiration of the applicable Cure Period falls during a non-Operating Time (if any), and the Logged Rectification Time is prior to the start of the next Operating Time for the Key Performance Area following the expiry of the Cure Period, then the Logged Failure Period shall be considered to be zero for that Performance Failure; provided that a Performance Deduction will apply to such a Performance Failure if the applicable Cure Period is also zero.

The Logged Failure Time related to Fare Calculations shall always be the end of the Operating Day upon which the User completed their Trip, regardless of when the Performance Failure was identified or recorded.

Notice of Performance Failure

If either Party becomes aware of a Performance Failure, the Party shall provide notice to the PTS (if given by the MBTA, an “**MBTA Performance Failure Notice**,” and if given by the Systems Integrator, a “**Systems Integrator Performance Failure Notice**”) containing the following information:

identification of the Key Performance Area and the Performance Failure that occurred;

details of the relevant fault, including all affected parts of the Key Performance Area and, where applicable, the relevant Cure Period believed to be applicable to the Key Performance Area affected; and

the reasons, to the extent known, why the Performance Failure has occurred.

The Systems Integrator shall cause the PTS to provide to the other Party a copy of any MBTA Performance Failure Notice or Systems Integrator Performance Failure Notice, as applicable, promptly upon receipt of same, and not later than 30 minutes following receipt.

Responding to Notice of Performance Failure

Following determination of the occurrence of a Performance Failure, including through the Systems Integrator Performance Failure Notice or MBTA Performance Failure Notice, the Systems Integrator shall assess the Performance Failure and provide to the MBTA in writing and via the PTS the following information to the extent possible using all reasonable efforts:

the cause of the Performance Failure;

whether the Performance Failure qualifies for a Cure Period in accordance with the Table 4 of this Appendix 8 and, where a Cure Period is allowed, the Cure Period applicable to the relevant Key Performance Area;

the Systems Integrator's plans for Rectifying any Performance Failure and the estimated period in which the Performance Failure will be Rectified; and

the extent, if any, to which the relevant Performance Failure is caused by a Supervening Event.

Until the Performance Failure is Rectified, the Systems Integrator shall provide to the MBTA:

a regular update, no less frequently than the relevant Recurrence Period for the Key Performance Area, on the progress made in curing such Performance Failure, together with any revised estimate as to when such Performance Failure will be made safe, if applicable, and Rectified;

promptly on becoming aware of any change to information previously provided to the MBTA regarding the Performance Failure, details of all such changes; and

the Monthly Performance Report content required in Section 4 of this Appendix 8, including such content which sets forth details of each event of Performance Failure reported in the Month together with confirmation of the time period between the Logged Failure Time and the Logged Rectification Time for each event of Performance Failure and the relevant number of Recurrence Periods.

Cessation of a Performance Failure

For the purposes of this Appendix 8, a Rectification is only considered complete when the Rectification has both been effected and has also been notified to the PTS.

The Systems Integrator shall immediately notify the PTS when any Performance Failure has been Rectified. The time of such notification will, subject to this Section 3.8, constitute the Logged Rectification Time in relation to such Performance Failure, and the Systems Integrator shall cause the PTS, as soon as is reasonably practicable after such notification by the Systems Integrator, and in any event within thirty (30) minutes, to notify the MBTA in writing that the relevant Performance Failure has been cured.

If, upon inspection, the MBTA determines that such Performance Failure has not been so Rectified, it shall notify the Systems Integrator and it shall be deemed that the Logged Rectification Time in respect of the incident has not yet occurred. The MBTA's decision will prevail for the purposes of determining whether the relevant Performance Failure has been Rectified, subject to the right of Systems Integrator to refer the matter to the Dispute Resolution Procedures.

Notices

All notices required to be provided under this Section 3 shall be deemed to be effective if provided by (a) email or (b) phone call or (c) using a web and mobile web portal that shall be provided by the SI as part of the PTS, or (d) as otherwise agreed between the Parties. The Systems Integrator shall convert any such phone call to an electronic message or electronic record in the PTS to which the Parties are concurrently notified, in each case containing the applicable requisite information under this Section 3.

Regular Events

The Parties recognize that on occasion, certain Locations experience increased demand. For all published events at the following venues as listed, from time to time, on each venue's website ("**Regular Events**"), the Key Performance Areas at the corresponding Locations will be classified as Location Category A for a period starting 2.5 hours prior to the published start of the event, and ending 1.5 hours following the end of the actual event, and the applicable Cure Period for Key Performance Area 20 shall be reduced by 50% for all Vehicles reasonably expected to serve these Locations.

| Venues | Corresponding Locations and Vehicles stopped at those Locations |
|------------------|---|
| Fenway Park | Blandford Fenway Kenmore Yawkey |
| Gillette Stadium | Back Bay Dedham Corp Gillette Stadium South Station |

| | |
|---------------|--|
| TD Garden | North Station |
| Agganis Arena | Babcock Street Pleasant Street St. Paul Street |

Exceptional Events

The Parties recognize that there will occasionally be special events (“**Exceptional Events**”) where the entire System, or portions of the System, experience increased demand. The Systems Integrator agrees to work cooperatively with the MBTA to provide service during these periods.

The MBTA may make a request of the Systems Integrator, providing reasonable advance notice (as much as is practical given logistical constraints but not less than 48 hours’ notice), that the Systems Integrator provide additional hardware maintenance or other resources at specific Locations during the Exceptional Event as notified by the MBTA. To the extent that the MBTA requests additional resources, the Systems Integrator shall exercise all reasonable efforts to provide the requested resources and each such request shall be treated as an MBTA Change.

Monthly Performance Report

The Monthly Performance Report shall be submitted by the Systems Integrator along with its Monthly Invoice and shall include the following information in respect of compliance with the System Availability Standards, Performance Standards and other aspects of performance:
System Availability Failures

Basis for calculations of measures, showing back-up information, including how actual periods of Availability and Total Potential Hours of Availability (or other applicable measure) were determined;

Actual compliance levels, including dates and times that compliance with the System Availability Standards was not achieved;

Calculation of any System Availability Deduction in respect of a System Availability Failure;

The Root Causes of any System Availability Failure and the investigations, monitoring and other steps taken to identify the cause where such information has not already been provided in respect of the linked Relevant Performance Standard;

Description of the steps being taken by the Systems Integrator to address the Root Causes of the System Availability Failure to ensure such failure does not recur, where such required information has not already been provided in respect of a linked Relevant Performance Standard; and

Provision of such other information evidencing the above as may be reasonably requested by the MBTA.

Performance Failures

Details of all Performance Failures that occurred, or were identified, during the relevant Month;

Calculation of any Performance Deductions in respect of relevant Performance Failures, showing work to align with the requirements of Section 3.2.3 of this Appendix 8;

The Root Cause of any Performance Failures and the investigations, monitoring and other steps taken to identify the Root Cause;

Description of the steps being taken by the Systems Integrator to address the Root Cause of the Performance Failure to ensure such failure does not recur;

All information specified in Section 3.7 of this Appendix 8 in respect of Performance Failures not Rectified; and

Provision of such other information evidencing the above as may be reasonably requested by the MBTA.

Summary of Maintenance Activities, Compliance and Other Content

As part of the Monthly Performance Report, the Systems Integrator shall also provide details of:

Preventative maintenance activities undertaken during the Month addressed by the Monthly Performance Report;

Preventative maintenance activities planned to be undertaken, in accordance with the agreed Master Maintenance Plan and as required in Appendix 4.6, during the first Month following the submission of the Monthly Performance Report which complies with the advance notice requirements of Appendix 4.6;

Explanation of any deviation from the Master Maintenance Plan or the requirements of Appendix 4.6 in respect of preventative maintenance;

The Compliance Report content required in Appendix 3.1; and

The Fraud Report content required in Appendix 3.5.

MBTA and Systems Integrator Operating Services Review Process

Annual Review

During the Operating Period, once per Fiscal Year, the MBTA and the Systems Integrator shall undertake a review of the Operating Services and meet to review aspects of the Operating Services including: The System Availability Deductions, Performance Deductions, System Availability Standards, Performance Standards, Cure Periods, Recurrence Periods and any other matters related to System Availability Failures and Performance Failures. The MBTA and the Systems Integrator shall act reasonably and diligently in carrying out any such review.

For the avoidance of doubt, the results of the review shall not alter the Systems Integrator's obligations under this Project Agreement. Where the Parties agree to implement a change resulting from the Annual Review, such proposed changes shall be deemed to be a Change and the provisions of Article 11 of this Project Agreement shall apply.

The MBTA and the Systems Integrator may, in respect of any matter that is the subject of a review, either:

agree that the status of the relevant matter shall continue to apply unchanged in the Fiscal Year immediately following the review; or

agree adjustments to the relevant matter to take effect in the Fiscal Year immediately following the review.

Any agreed adjustment pursuant to a review shall be effective from the commencement of the Fiscal Year immediately following the relevant review carried out in accordance with this Section 5.1 of this Appendix 8.

To the extent that the Parties do not agree on any matter, the requirements of this Project Agreement shall remain unchanged.

Joint Technical Review

Except as provided in this Section 5.2 of this Appendix 8 and without limiting anything under Section 8.3 of this Project Agreement or any obligation of the Systems Integrator hereunder, the Systems Integrator and MBTA may conduct a Joint Technical Review at the election of the MBTA (acting reasonably) by written notice to the Systems Integrator over a period not to exceed 90 days commencing upon the Systems Integrator's receipt of the such notice (the "**Joint Technical Review**").

Joint Technical Review Triggers

The Systems Integrator and the MBTA shall conduct a Joint Technical Review of the System if the total Deductions incurred by the Systems Integrator during any rolling 3-month period following the first anniversary of the Full Service Commencement Date exceed 5% of the total Base Monthly Payments otherwise payable to the Systems Integrator over such period. The Joint Technical Review will assess:

the condition of all relevant Key Performance Areas, as determined by the MBTA, acting reasonably, based on the nature of the Deductions triggering the Joint Technical Review;

the effectiveness of the performance of the Systems Integrator's maintenance obligations hereunder to achieve compliance with the Contract Standards; and

assuming the Systems Integrator will carry out the Master Maintenance Plan and any additional requirements set out in Appendix 4.6 for the remainder of the Term, the effectiveness of the Master Maintenance Plan to achieve compliance with the Contract Standards and, as of the Expiration Date, the Handback Requirements.

During the Handback Period, the Parties shall carry out the inspection provisions of the Handback Requirements in lieu of any Joint Technical Review that may otherwise be required under this Section 5.2 of this Appendix 8.

Independent Evaluator

The Parties shall cooperate to jointly appoint a suitably qualified and experienced consultant (or firm of consultants) to act as the independent evaluator for any Joint Technical Review (the “**Independent Evaluator**”). The Systems Integrator shall be solely responsible for the cost of the Independent Evaluator engaged to conduct each Joint Technical Review. Within 30 days following the delivery of notice by the MBTA of its election to require a Joint Technical Review in accordance with Section 5.2 of this Appendix 8:

The Systems Integrator shall provide a proposal from three candidates acceptable to the Systems Integrator, acting reasonably, for consideration by the MBTA;

Within 10 Business Days following receipt of the candidate names, the MBTA shall notify the Systems Integrator of the candidates acceptable to the MBTA, and the Parties, each acting reasonably, shall cooperate to enter into a commercially reasonable contract with an acceptable candidate, which contract shall establish the independence of, and the scope of services to be performed by, the Independent Evaluator consistent with the requirements of this Section 5.2 of this Appendix 8; and

If none of the candidates are acceptable to the MBTA, acting reasonably, or if for any reason an Independent Evaluator is not appointed 90 days following the delivery of notice by the MBTA of its election to require a Joint Technical Review in accordance with Section 5.2 of this Appendix 8, then the Parties shall proceed in accordance with the Dispute Resolution Procedures.

Cooperation and Coordination

The Parties shall cooperate with one another generally in relation to all matters within the scope of or in connection with the appointment of the Independent Evaluator. All instructions and representations issued or made by either the MBTA or the Systems Integrator shall be simultaneously copied to the other and both the MBTA and the Systems Integrator shall be entitled to attend all inspections undertaken by, or meetings involving, the Independent Evaluator; provided that, without limiting any right otherwise provided to the MBTA hereunder in respect of the Proprietary Intellectual Property, the Independent Evaluator shall be provided access to Proprietary Intellectual Property to the extent necessary to perform inspections within the scope of the Joint Technical Review, which access may, if requested by the Systems Integrator, be subject to commercially reasonable confidentiality restrictions to protect the confidentiality and proprietary nature of the Proprietary Intellectual Property.

Independence of the Independent Evaluator

The Independent Evaluator shall owe a duty of care to both the MBTA and the Systems Integrator jointly and shall act impartially and independently of the MBTA

and the Systems Integrator in the performance of its duties as contemplated in this Section 5. Nothing in this Project Agreement shall be interpreted as giving the Independent Evaluator any responsibility or authority for any aspect of the Contract Services, or as relieving the Systems Integrator of its responsibility for the Contract Services, and no Systems Integrator Person shall be entitled to rely on any advice or approvals that the Independent Evaluator may give with respect to the Project. Without limiting anything set forth in this Section 5.2, either Party may object to the appointment of a consultant to serve as the Independent Evaluator on the basis that the consultant is not financially independent of the other Party.

Required System Condition

The System condition standard for each Joint Technical Review shall be based on the principle that each System Element will be maintained in a condition which is consistent with the performance of the Contract Services in accordance with the Contract Standards.

System Condition Report

The findings of each Joint Technical Review shall be documented in a written report prepared by the Independent Evaluator within 20 Business Days following such Joint Technical Review (a **“System Condition Report”**) that:
identifies the condition of each System Element within the scope of the Joint Technical Review, as determined in accordance with Section 5.2.1.1 of this Appendix 8; and

identifies any deficiencies in the condition of any such System Elements or in the performance of the maintenance obligations of the Systems Integrator under this Project Agreement, including any deficiencies in the Master Maintenance Plan or compliance with Appendix 4.6.

Remediation

If any System Condition Report identifies any deficiency contemplated under Section 5.2.6 of this Appendix 8, the Systems Integrator shall:
within 15 Business Days following receipt of the System Condition Report, prepare a remediation plan outlining its approach and proposed schedule for rectification of the identified deficiencies, including through integration with the Master Maintenance Plan and any additional requirements of Appendix 4.6, to ensure compliance with the Contract Standards and ensure that all aspects of the System will be functional to the standard specified in the Handback Requirements on the Expiration Date;

obtain the MBTA’s reasonable acceptance of the remediation plan in accordance with Appendix 7 (MBTA Review Procedures); and

implement the accepted remediation plan.

Further Evaluation

Unless the MBTA and the Systems Integrator mutually agree that subsequent inspection is unnecessary, the Independent Evaluator shall undertake a subsequent inspection of any

remediation work completed by the Systems Integrator under Section 5 of this Appendix 8 and issue a revised System Condition Report.

MBTA and Systems Integrator Transaction Payment Review Process

Transaction Payment Review Process

Periodically throughout the Term and without limiting anything under Sections 6.2.1 and 6.2.3 of this Appendix 8, the MBTA or the Systems Integrator may elect to undertake a review of changes of the market price for Allowable AP Transaction Fees (including each review required under Sections 6.2.1 and 6.2.3, a **“Transaction Payment Review Process”**).

Transaction Payment Review Process Triggers and Payment Responsibility

The Transaction Payment Review Process will be undertaken at the following times:

Pre-Pilot Phase 1 Review

No later than 90 days prior to the commencement of the Pilot Phase 1, the MBTA and the Systems Integrator shall undertake a Transaction Payment Review Process focused solely on the variable transaction costs for provisioning and maintaining the Fare Card in mobile wallets. The Parties shall in the cost of such Transaction Payment Review Process.

In connection with and as part of such Transaction Payment Review Process, the Parties shall cause the Independent Payment Consultant to recommend the Chargeback and PAYG Loss Baseline in accordance with Section 6.9 of this Appendix 8. The Chargeback and PAYG Loss Baseline shall be established, and may be amended, pursuant to Section 6.9 of this Appendix 8.

Optional Review

At any time after the Revenue Service Commencement Date, either the Systems Integrator or the MBTA may elect to undertake a Transaction Payment Review Process by written notice to the other Party specifying the intended scope of the Transaction Payment Review Process, including the specific Allowable AP Transaction Fees to be considered. The Transaction Payment Review Process may focus on one or more of the categories of Allowable AP Transaction Fees; however, it must review all fees within a single category of the Allowable AP Transaction Fees and cannot focus on a subset of fees within a category.

The Party requesting such optional Transaction Payment Review Process shall pay the cost of such Transaction Payment Review Process; provided that, if the MBTA makes such an election and it is determined that changes need to be made to effectuate compliance with the requirements specified Appendix 3.6 and Appendix 4.7 in respect of cost optimization and optimal transaction models (such requirements, the **“Payment Processing Requirements”**) or to correct any other Systems Integrator Fault, the Systems Integrator shall be responsible for all cost and expense of such optional Transaction Payment Review Process and shall reimburse

the MBTA on demand for any cost or expense incurred in connection therewith prior to such determination.

Fifth Anniversary of Revenue Service Commencements

No earlier than 180 days and no later than 90 days prior to the fifth anniversary of the Revenue Service Commencement Date, the MBTA and the Systems Integrator shall undertake a Transaction Payment Review Process. The Parties shall equally share in the cost of such Transaction Payment Review Process; provided that, if the MBTA makes such an election and it is determined that changes need to be made to effectuate compliance with the Payment Processing Requirements or to correct any other Systems Integrator Fault, the Systems Integrator shall be responsible for all cost and expense of such optional Transaction Payment Review Process and shall reimburse the MBTA on demand for any cost or expense incurred in connection therewith prior to such determination.

Independent Payment Consultant Selection

The Parties shall cooperate to jointly appoint a suitably qualified and experienced consultant (or firm of consultants) to act as the independent consultant for any Transaction Payment Review Process and to perform the services required hereunder in respect of the Chargeback and PAYG Loss Baseline and any Eligible Subtractions Report (the **“Independent Payment Consultant”**). Except as otherwise expressly provided hereunder, the Parties shall equally share in the cost of any Independent Payment Consultant engaged to conduct any Transaction Payment Review Process or perform any other Independent Payment Consultant services specified hereunder.

No later than 180 days prior to the commencement of the Pilot Phase 1 and, if no Independent Payment Consultant has been appointed by the Parties at such time, within (a) 30 days following any notice by either Party pursuant to Section 6.2.2 of this Appendix 8 or (b) a reasonable period prior to any required Independent Payment Consultant Services hereunder:

The Systems Integrator shall provide a proposal from three candidates acceptable to the Systems Integrator, acting reasonably, for consideration by the MBTA;

Within 10 Business Days following receipt of the candidate names, the MBTA shall notify the Systems Integrator of the candidates acceptable to the MBTA and the Parties, each acting reasonably, shall cooperate to enter into a commercially reasonable contract with an acceptable candidate, which contract shall establish the independence of, and the scope of services to be performed by, the Independent Payment Consultant consistent with the requirements of this Section 6 of this Appendix 8 and, as applicable, Appendix 4.2; and

If none of the candidates are acceptable to the MBTA, acting reasonably, or if for any reason an Independent Payment Consultant is not appointed 30 days following the delivery of the candidate names, then the Parties shall proceed in accordance with the Dispute Resolution Procedures. Following the first Transaction Payment Review Process, either Party may request that the Independent Payment Consultant previously agreed is retained. The other Party may either accept or deny such request in its sole discretion. If the request is denied the Parties shall cooperate to jointly appoint an Independent Payment Consultant in accordance with Section

6.3.1 of this Appendix 8. Nothing in this Section 6.3.3 shall limit the Systems Integrators choice of candidates to be provided in accordance with Section 6.3.2.1 of this Appendix 8.

Independence and Qualifications of the Independent Payment Consultant

Any person serving as the Independent Payment Consultant shall be appropriately qualified to perform the role of the Independent Payment Consultant hereunder, as determined by reference to Good Industry Practice and based on experience in account-based, open payments systems for transit fare collections systems. The Independent Payment Consultant shall owe a duty of care to both the MBTA and the Systems Integrator jointly and shall act impartially and independently of the MBTA and the Systems Integrator in the performance of its duties as contemplated in this Section 6 and in Appendix 4.2. Nothing in this Project Agreement shall be interpreted as giving the Independent Payment Consultant any responsibility or authority for any aspect of the Contract Services, or as relieving the Systems Integrator of its responsibility for the Contract Services, and no Systems Integrator Person shall be entitled to rely on any advice or approvals that the Independent Payment Consultant may give with respect to the Project.

Without limiting anything set forth in this Section 6.3, either Party may object to the appointment of a consultant to serve as the Independent Payment Consultant on the basis that the consultant is not financially independent of the other Party.

Cooperation and Coordination

The Parties shall cooperate with one another generally in relation to all matters within the scope of or in connection with the appointment of the Independent Payment Consultant. All instructions and representations issued or made by either the MBTA or the Systems Integrator shall be simultaneously copied to the other and both the MBTA and the Systems Integrator shall be entitled to attend all inspections undertaken by, or meetings involving, the Independent Payment Consultant; provided that, without limiting any right otherwise provided to the MBTA hereunder in respect of the Proprietary Intellectual Property, the Independent Payment Consultant shall be provided access to Proprietary Intellectual Property to the extent necessary to perform inspections within the scope of any Transaction Payment Review Process or any other review to be conducted by the Independent Payment Consultant hereunder, which access may, if requested by the Systems Integrator, be subject to commercially reasonable confidentiality restrictions to protect the confidentiality and proprietary nature of the Proprietary Intellectual Property. In connection with each such review, the Independent Payment Consultant shall be provided access to all escrowed documents relating to the Allowable AP Transaction Fees (as required pursuant to Appendix 14) and to the Data and services which the Systems Integrator is otherwise required by this Project Agreement to make available to the MBTA in respect of payment transactions or any other aspect of the Contract Services that may be relevant to the scope of the review..

Joint Transaction Cost Report

In connection with each Transaction Payment Review Process, the Independent Payment Consultant shall prepare a report on behalf of both the Systems Integrator and the MBTA in respect of the relevant Transaction Review Period (a “**Joint Transaction Cost Report**”). The Joint Transaction Cost Report shall, as a minimum, contain the following information for the relevant Transaction Review Period:

A full breakdown of the actual Allowable AP Transaction Fees that the Transaction Payment Review Process is required to review;

Analysis of how the market pricing of the applicable Allowable AP Transaction Fees have changed over the Transaction Review Period;

An analysis of changing market conditions and payment technology (including changes in the operating systems and capabilities of mobile devices commonly carried by Users) over the Transaction Review Period that could reduce the degree to which the System is subject Allowable AP Transaction Fees;

Analysis of the extent to which the System and the Systems Integrator have complied with all Payment Processing Requirements over the Transaction Review Period;

Recommendation of changes to:

Effectuate compliance with the requirements specified Appendix 3.6 and Appendix 4.7 in respect of cost optimization and optimal transaction models; and/or

Subject to the limitations set forth in Sections 6.6, the Allowable AP Transaction Rates to provide that the Systems Integrator would be No Better and No Worse from the beginning of the next Month to the end of the Term to take into account the changes in market pricing related to Allowable AP Transaction Fees (an “**AP Transaction Change**”); for the avoidance of doubt, the recommended changes are only to reflect the movement in market pricing related to Allowable AP Transaction Fees and are not necessarily resetting the Allowable AP Transaction Rates so that they equal the underlying costs of the Allowable AP Transaction Fees. Further, any AP Transaction Change is forward looking and is not intended to provide protection to the Systems Integrator for historical costs incurred or those to be incurred prior to the beginning of the following Month; and

For the Joint Transaction Cost Report required in connection with the Transaction Payment Review Process required pursuant to Section 6.2.3 of this Appendix 8 and each Joint Transaction Report thereafter, recommend Allowable AP Transaction Rates necessary to provide that the Allowable AP Transaction Rates equal the underlying costs of Allowable AP Transaction Fees; i.e., the Allowable AP Transaction Rates are reset to equal the market price of Allowable AP Transaction Fees (an “**AP Transaction Reset**”); for the avoidance of doubt the AP Transaction Reset corresponding to the fifth anniversary of the Revenue Service Commencement Date may result in changes to the Allowable AP Transaction Rates which are greater than, or less than, the corresponding change in market pricing of Allowable AP Transaction Fees compared to the most recent AP Transaction Change.

Due to the fact that Allowable AP Transaction Rates included in Table 8 of this Appendix 8 are Index Linked automatically as part of the Monthly Payment calculation worksheet, each Joint Transaction Cost Report shall take into account the Inflation Factor (Line 5b) to be included in Monthly Payment calculation worksheet for the Month when the AP Transaction Change or AP Transaction Reset shall apply, so that there is no double counting of inflation.

MBTA Review

No later than 30 days after the MBTA's receipt of a Joint Transaction Cost Report, the MBTA, acting reasonably, shall make a written determination in respect of such Joint Transaction Cost Report as to whether it agrees with any recommended AP Transaction Change or AP Transaction Reset, as applicable, and the Transaction Payment Review Process shall be considered complete. In the event the Systems Integrator disputes the MBTA's determination, the Parties shall proceed in accordance with the Dispute Resolution Procedures; provided that, subject to the MBTA's discretionary right under Section 6.6, the Parties shall be required to agree to the recommendations set forth in a Joint Transaction Report unless either Party reasonably and in good faith believes that there are errors or omissions in the Joint Transaction Report (including any failure to properly account for the extent of the Systems Integrator's compliance with the Payment Processing Requirements or as otherwise specified in Section 6.8) or that the applicable Transaction Payment Review Process was not conducted in accordance with Good Industry Practice (including proper consideration of comparator transit agencies or changes in technology) or the requirements of this Section 6, including the extent of access provided to the Independent Payment Consultant pursuant to Section 6.3.5.

Adjustment to Allowable AP Transaction Rates

If an AP Transaction Change is agreed or determined to be necessary pursuant to Section 6.5 of this Appendix 8, the applicable Allowable AP Transaction Rate (column A) amounts in Table 7 and Table 8 of this Appendix 8 shall be updated to reflect such AP Transaction Change, and such updated Allowable AP Transaction Rate amounts shall apply from the beginning of the following Month for the remainder of the Term, unless further adjusted in accordance with this Section 6; provided that, in connection with the Transaction Payment Review Process undertaken pursuant to Section 6.2.3 of this Appendix 8 and each Transaction Payment Review Process thereafter, the MBTA may, in its sole discretion, elect to either:

apply the AP Transaction Change; or

apply the AP Transaction Reset.

If the MBTA elects to apply the AP Transaction Reset, the resulting Allowable AP Transaction Rates, shall apply from the beginning of the following Month for the remainder of the Term, unless further adjusted in accordance with this Section 6.

In no event may any costs associated with the implementation, upgrade, testing, certification or recertification associated with the provisioning and maintaining the Fare Card in mobile wallets, or any other costs associated with compliance with the Technical

Requirements, be included in the calculation of any AP Transaction Change or AP Transaction Reset.

For the avoidance of doubt, the Other AP Transaction Rate (column B) amounts in Table 7 and Table 8 of this Appendix 8 shall not be subject to change unless as part of a Change pursuant to Article 11 of the Project Agreement.

No Adjustment to Allowable AP Transaction Rates

If pursuant to Section 6.5 of this Appendix 8 it is agreed or determined that an AP Transaction Change or AP Transaction Reset is not necessary, the Allowable AP Transaction Rates previously in-place shall continue to apply for the remainder of the Term, unless further adjusted in accordance with this Section 6.

Payment Processing Requirements

Without limiting any right of the MBTA hereunder, the MBTA shall have no obligation to agree to any AP Transaction Change to the extent the same is determined necessary due to a failure of compliance by the System or the Systems Integrator with the Payment Processing Requirements. In the event it is determined pursuant to any Transaction Payment Review Process that the System or the Systems Integrator is not compliant with the Payment Processing Requirements, the Systems Integrator shall take all action necessary to correct the issue.

Chargeback and PAYG Loss Baseline

In connection with and as part of the Transaction Payment Review Process required under Section 6.2.1, the Independent Payment Consultant will evaluate available industry data concerning account-based, open payments transit fare systems and information specific to the MBTA (including all relevant Technical Requirements and any local or regional factors that may reasonably influence Chargebacks and PAYG Loss) to recommend a baseline Monthly amount of Chargebacks and PAYG Loss (organized by Transaction Channel and other appropriate factors determined in accordance with Good Industry Practice to enable separate consideration of each component part) that may reasonably be expected to be incurred by the Systems Integrator in performing the Operating Services (as established from time to time pursuant to this Section, the “**Chargeback and PAYG Loss Baseline**”). The initial Chargeback and PAYG Loss Baseline shall be established in accordance with the following:

Not later than 60 days prior to the commencement of Pilot Phase 1, the Independent Payment Consultant shall provide the Parties with a written report recommending a Chargeback and PAYG Loss Baseline with supporting analysis;

Within 15 days of receiving such written report, both the MBTA and the SI shall respond to the other and to the Independent Payment Consultant in writing, signifying either acceptance or rejection of the recommended Chargeback and PAYG Loss Baseline;

The failure of either Party to respond within such 15-day period shall be deemed an acceptance of the recommended Chargeback and PAYG Loss Baseline;

The findings of the Independent Payment Consultant shall be final and binding only to the extent the Parties accept such findings, either expressly or to the extent deemed accepted by virtue of that Party's failure to respond within such 10-day period;

Neither Party shall reject the recommended Chargeback and PAYG Loss Baseline unless such Party has a reasonable and good faith belief that there are errors or omissions in the Independent Payment Consultant's report; and

If either Party rejects the recommended Chargeback and PAYG Loss Baseline, the Parties shall meet and confer with the Independent Payment Consultant and otherwise proceed in accordance with the Dispute Resolution Procedures until the Parties reach agreement as to the initial Chargeback and PAYG Loss Baseline.

The Parties shall share equally in the cost of engaging the Independent Payment Consultant to assist in the establishment of the initial Chargeback and PAYG Loss Baseline. The MBTA shall have the right, in its discretion and at any time by written notice to the Systems Integrator, to change the amount of the Chargeback and PAYG Loss Baseline to any amount greater than the Chargeback and PAYG Loss Baseline established between the Parties pursuant to this Section 6.9, which right shall include the right to increase and subsequently decrease the Chargeback and PAYG Loss Baseline by written notice to the Systems Integrator; provided that no such notice shall result in a Chargeback and PAYG Loss Baseline that is lower than the Chargeback and PAYG Loss Baseline established between the Parties pursuant to this Section 6.9.

Either Party shall have the right to elect to engage the Independent Payment Consultant to reconsider the Chargeback and PAYG Loss Baseline established between the Parties pursuant to this Section 6.9 at any time, and the Party requesting such reconsideration shall pay all related cost and expense of the Independent Payment Consultant. Any such reconsideration shall result in a report of the Independent Payment Consultant (which may or may not recommend a change to the applicable Chargeback and PAYG Loss Baseline) for consideration by the Parties in accordance with the procedures set forth in Sections 6.9.2 through 6.9.6. If a change to the Chargeback and PAYG Loss Baseline is recommended by the Independent Payment Consultant and accepted by the Parties pursuant to such procedures, such changed Chargeback and PAYG Loss Baseline shall become the Chargeback and PAYG Loss Baseline established between the Parties pursuant to this Section 6.9.

Invoicing Arrangements

Monthly Invoice

The MBTA requires that the form of Monthly Invoice reflect its budget and accounting structure. The Parties shall use all reasonable efforts to agree on the format of the Monthly Invoice before the commencement of the Pilot Phase 1, which may include more than one invoice reflecting the split of the payment stream and the portion of those payments that are subject to Deductions. To the extent that the Parties do not reach agreement, the Systems Integrator shall submit separate invoices for each of the following:

APT;

APC less prorata Deductions (including retroactively applied Deductions and disputed Deductions) plus prorata Earn Backs;

APO less prorata Deductions (including retroactively applied Deductions and disputed Deductions), minus Communications Networks amounts and other costs payable to the MBTA, plus prorata Earn Backs; and

For portions of any Compensation Event which does not modify a component of the AP.

MBTA Budgeting Process Support

The Systems Integrator acknowledges that the split between APC, APT and APO may not align with the MBTA's definition of capital vs. operating and regardless of how invoices are prepared, the Systems Integrator will work with the MBTA to develop a process for appropriately allocating costs for the MBTA's budget and reporting processes.

Table 1
Operating Times by Key Performance Area

| No. | Key Performance Area | Operating Times |
|-----|--|---|
| 1 | The System Website, IVR, and Fare Card Mobile Application (to the extent the latter is used to provide Account management functionality), their respective APIs, and all related Operating Services | 24 hours per day, 7 days per week |
| 2 | The Administrator Interfaces, the related APIs, the related Operating Services, and all Operating Services involved in complying with all Account management and Account servicing requirements, including those set forth in Appendix 3.7, Appendix 3.8. and Appendix 4.4 | 24 hours per day, 7 days per week |
| 3 | The Automated Monitoring Subsystem and all related Operating Services | 24 hours per day, 7 days per week |
| 4 | The Performance Tracking System and all related Operating Services | 24 hours per day, 7 days per week |
| 5.1 | The Operating Services involved in delivering Submittals other than reports | Business Hours, except as specified in the requirements for the particular Submittal |
| 5.2 | The Operating Services involved in delivering Submittals which are reports | Business Hours, except as specified in the requirements for the particular Submittal |
| 6 | The Operating Services involved in fulfilling Configuration and change Management requirements, including those set forth in Appendix 4.3 | 24 hours per day, 7 days per week, except as specified in the requirements for the particular Configuration |
| 7 | The System Elements and Operating Services involved in fulfilling requirements in respect of Fare calculation, charges to Users for Products and Enablement Fees, verification of travel entitlements, and charging Users any other amounts | 24 hours per day, 7 days per week |
| 8 | The Operating Services involved in meeting any order fulfilment requirements, including those set forth in Appendix 3.8 and Appendix 4.4 and Appendix 2.15 | 24 hours per day, 7 days per week |
| 9 | The Operating Services involved in ensuring compliant deposits of Fare Revenue occur, including as set forth in Appendix 4.2 | 24 hours per day, 7 days per week |
| 10 | The Operating Services involved in ensuring compliance with PCI-SSC-related standards, including those set forth in Appendix 3.1 | 24 hours per day, 7 days per week |
| 11 | The Operating Services involved in ensuring compliance with all requirements set forth in Appendix 3.1 but excluding those in respect of PCI-SSC, and the | 24 hours per day, 7 days per week |

| No. | Key Performance Area | Operating Times |
|-----|---|---|
| | network segmentation and isolation requirements of Appendix 2.5 | |
| 12 | The Integrated Services APIs and Location Data APIs and all related Operating Services | 24 hours per day, 7 days per week |
| 13 | The Reader APIs, Readers used for Expansion, any implementation of the MBTA Fare Gate Interface Controller Board, and all related Operating Services | 24 hours per day, 7 days per week for the Reader APIs, and otherwise: any time when Transportation Services are provided to, from, or through the Location or Vehicle in which such System Element is located |
| 14 | The System Elements involved in ensuring compliance with the Account Data Timeliness Revenue Protection Standards and all related Operating Services | 24 hours per day, 7 days per week |
| 15 | The Model Office and all related Operating Services (including all Devices) | 24 hours per day, 7 days per week during testing of a Configuration change with a published implementation date. 20 hours a day: 12am-1am and 5am-12am at all other times. |
| 16 | The Operating Services involved in ensuring compliance with all requirements related to safety and Applicable Law, including as set forth in Appendix 2.11 | 24 hours per day, 7 days per week |
| 17 | The System Elements and Operating Services involved in ensuring compliance with all requirements regarding Fare Card characteristics and quality, including as set forth in Appendix 2.6 and Appendix 4.4 | 24 hours per day, 7 days per week |
| 18 | Gates (and Readers contained within) and all related Operating Services | Any time when Transportation Services are provided to, from, or through the Location in which such System Element is located |
| 19 | Station Validators (and Readers contained within) and all related Operating Services | Any time when Transportation Services are provided to, from, or through the Station in which such Station Validator is located |
| 20 | Vehicle Validators (and Readers contained within), associated System Validation Equipment, and all related Operating Services | Any time when the Vehicle on which such Vehicle Validator is installed is assigned to operate Transportation Services |

| No. | Key Performance Area | Operating Times |
|-----|---|--|
| 21 | Fare Vending Machines and all related Operating Services | Any time when Transportation Services are provided to, from, or through the Location in which such System Element is located |
| 22 | Retail Reload Locations Administrative Point of Sales, and all related Operating Services | Any time when the Retail Reload Location or Administrative Point of Sales (respectively) is scheduled to be open |
| 23 | The Operating Services involved in ensuring that each Device complies with the requirements in respect of maintaining reasonably clean appearance, including all those set forth in Appendix 4.6 and as per the Preventative Maintenance Plan | Any time when Transportation Services are provided to, from, through, or using the Location or Vehicle in which such System Element is located |
| 24 | The Operating Services involved in retrieving Taps from Offline Readers and Inspection Devices to comply with the Technical Requirements | 24 hours per day, 7 days per week |
| 25 | Inspection Devices and all related Operating Services | 24 hours per day, 7 days per week |
| 26 | The System Elements and Operating Services involved in ensuring compliance with the requirements in respect of the Supplemental Monitoring Process | 24 hours per day, 7 days per week |
| 27 | The Operating Services and System Elements involved in complying with the Communications Networks requirements set forth in Appendix 2.5, except only in respect of the availability of the Communications Networks to interconnect other System Elements | 24 hours per day, 7 days per week |
| 28 | The External Interfaces and all related Operating Services | 24 hours per day, 7 days per week |

Table 2

System Availability Standards, and Determination of System Impact Multiplier

| No. | System Availability Standard | Relevant Performance Standard | Key Performance Area(s) | Measurement, in each case for the Month | Measure | SIM |
|-----|---|-------------------------------|-------------------------|---|---------------------------------|-----|
| 1 | All Gates (and Readers contained within) are operating in accordance with the Technical Requirements | Performance Standard 1 | 18 | Total Compliant Hours for all Gates (and Readers contained within) divided by the Total Potential Hours of Availability for all Gates | 100% - 99% | 0% |
| | | | | | <99% - 96% | 1% |
| | | | | | <96% - 92% | 3% |
| | | | | | <92% - 80% | 5% |
| | | | | | <80% | 20% |
| 2 | All Validators (and Readers contained within and inclusive of System Validation Equipment for Vehicle Validators) are operating in accordance with the Technical Requirements | Performance Standard 2 | 19, 20 | Total Compliant Hours for all Validators (and Readers contained within) divided by the Total Potential Hours of Availability for all Validators | 100% - 99% | 0% |
| | | | | | <99% - 96% | 1% |
| | | | | | <96% - 94% | 3% |
| | | | | | <94 - 90% | 5% |
| | | | | | <90% | 20% |
| 3 | All Fare Vending Machines are operating in accordance with the Technical Requirements | Performance Standard 3 | 21 | Total Compliant Hours for all Fare Vending Machines divided by the Total Potential Hours of Availability for all Fare Vending Machines | 100% - 98% | 0% |
| | | | | | <98% - 95% | 1% |
| | | | | | <95% - 93% | 3% |
| | | | | | <93 - 90% | 5% |
| | | | | | <90% | 20% |
| 4 | Daily deposit of Revenue – 100% timely, accurate deposit of Fare Revenue by the SI and submission of reconciled back-up | Performance Standard 4 | 9 | Number of days on which deposit met the requirements of Appendix 4.2 | All days or all but one (1) day | 0% |
| | | | | | All but two (2) days | 1% |
| | | | | | All but three (3) days | 3% |
| | | | | | All but four (4) days | 5% |
| | | | | | | |

| No. | System Standard Availability | Relevant Performance Standard | Key Performance Area(s) | Measurement, in each case for the Month | Measure | SIM |
|-----|--|-------------------------------|-------------------------|---|--|-----|
| | Data occur in accordance with the Contract Standards | | | | Zero, or all but more than four (4) days | 20% |
| 5 | Fare calculation – 100% of Fares and other amounts charged (including for Products and Enablement Fees), and travel entitlements validated, are calculated and applied correctly, in accordance with Fare Policy and Configuration, documented with supporting Data, and applied in the timeframes set forth in the Technical Requirements. ¹ | Performance Standard 5 | 7 | Number of compliant calculations divided by the number of total calculations | 100% - 99.995% | 0% |
| | | | | | <99.995% - 99.99% | 1% |
| | | | | | <99.99% - 99.95% | 3% |
| | | | | | <99.95% - 99% | 5% |
| | | | | | <99% | 20% |
| 6 | All Configuration and change management work is implemented on time and in accordance with the Technical Requirements, including successful completion of testing | Performance Standard 6 | 6 | Number of days on which all Configuration and Change Management are implemented on time and in accordance with the Technical Requirements | All days or all but one (1) day | 0% |
| | | | | | All but two (2) days | 1% |
| | | | | | All but three (3) days | 3% |
| | | | | | All but four (4) days | 5% |
| | | | | | Zero, or all but more than four (4) days | 20% |
| 7 | All Administrator Interfaces and all | Performance Standard 7 | 2 | Total Compliant Hours for the Administrator Interfaces plus | 100% – 99.9% | 0% |
| | | | | | <99.9% - 99% | 1% |

¹ For the avoidance of doubt, this Deduction is in addition to any Contract Standards requiring deposit of Fare Revenue to MBTA and application of Automatic Refunds to Users

| No. | System Standard | Availability | Relevant Performance Standard | Key Performance Area(s) | Measurement, in each case for the Month | Measure | SIM |
|-----|--|---|-------------------------------|-------------------------|---|--|-----------------------|
| | | respective APIs are operating in accordance with the Technical Requirements | | | the Total Compliant Hours for all respective APIs combined, divided by twice the Total Potential Hours of Availability for the Administrator Interfaces | <99% | 5% |
| 8 | The Automated Monitoring Subsystem (AMS) is operating in accordance with the Technical Requirements | | Performance Standard 8 | 3 | Total Compliant Hours for the AMS divided by Total Potential Hours of Availability for the AMS | 100% - 99.95% <99.95% - 99.5% <99.5% | 0% 1% 12% |
| 9 | The System Website, the Fare Card Mobile Application (if used to provide access to Account management functionality) and the IVR and each of their respective APIs are operating in accordance with the Technical Requirements | | Performance Standard 9 | 1 | Total Compliant Hours for the least Available of (i) the System Website, (ii) the Fare Card Mobile Application (if used to provide access to Account management functionality), (iii) the IVR, and (iv) the corresponding APIs, divided by the average Total Potential Hours of Availability of (i) the System Website, (ii) the Fare Card Mobile Application (if used to provide access to Account management functionality), (iii) the IVR, and (iv) the corresponding APIs | 100% - 99.9% <99.9% - 99% <99% - 98% <98% | 0% 1% 2% 12% |
| 10 | All Locations and | | No Relevant | 18, 19, 20, | Sum of the count of days for | 100% - 98% | 0% |

| No. | System Standard Availability | Relevant Performance Standard | Key Performance Area(s) | Measurement, in each case for the Month | Measure | SIM | | | | | | | | | | |
|----------------|---|----------------------------------|-------------------------|---|--|--------------|----|----------------|----|--------------|----|-----------|-----|------|-----|--|
| | Vehicles for which the SI is required to provide Devices, System Elements or Retail Reload Locations in order to comply with the requirements of Appendix 2.10, have said Devices, System Elements or Retail Reload Locations | Performance Standard | 21, 22 | each compliant individual Location and Vehicle, divided by the sum of the count of days for each individual Location and Vehicle required by Appendix 2.10 | <table border="1"> <tr><td><98% - 95%</td><td>1%</td></tr> <tr><td><95% - 93%</td><td>3%</td></tr> <tr><td><93 - 90%</td><td>5%</td></tr> <tr><td><90%</td><td>20%</td></tr> </table> | <98% - 95% | 1% | <95% - 93% | 3% | <93 - 90% | 5% | <90% | 20% | | | |
| <98% - 95% | 1% | | | | | | | | | | | | | | | |
| <95% - 93% | 3% | | | | | | | | | | | | | | | |
| <93 - 90% | 5% | | | | | | | | | | | | | | | |
| <90% | 20% | | | | | | | | | | | | | | | |
| 11 | All Locations and Vehicles containing Devices, System Elements and Retail Reload Locations have the correct quantity of said Devices, System Elements and Retail Reload Locations in order to comply with the requirements of Appendix 2.10 | No Relevant Performance Standard | 18, 19, 20, 21, 22 | Sum of the count of days for each compliant Device, System Element and Retail Reload Location, divided by the sum of the count of days for each Device, System Element and Retail Reload Location required by Appendix 2.10 | <table border="1"> <tr><td>100% - 98%</td><td>0%</td></tr> <tr><td><98% - 95%</td><td>1%</td></tr> <tr><td><95% - 93%</td><td>3%</td></tr> <tr><td><93 - 90%</td><td>5%</td></tr> <tr><td><90%</td><td>20%</td></tr> </table> | 100% - 98% | 0% | <98% - 95% | 1% | <95% - 93% | 3% | <93 - 90% | 5% | <90% | 20% | |
| 100% - 98% | 0% | | | | | | | | | | | | | | | |
| <98% - 95% | 1% | | | | | | | | | | | | | | | |
| <95% - 93% | 3% | | | | | | | | | | | | | | | |
| <93 - 90% | 5% | | | | | | | | | | | | | | | |
| <90% | 20% | | | | | | | | | | | | | | | |
| 12 | The System is compliant with all Account Data Timeliness Customer Service Standards | No Relevant Performance Standard | 7 | Number of transactions and other triggering events that meet the Account Data Timeliness Customer Service Standards divided by the total number of transactions and other triggering events covered by the Account Data Timeliness Customer Service Standards | <table border="1"> <tr><td>100% - 99.9%</td><td>0%</td></tr> <tr><td><99.9% - 99.5%</td><td>2%</td></tr> <tr><td><99.5% - 97%</td><td>3%</td></tr> <tr><td><97 - 90%</td><td>20%</td></tr> <tr><td><90%</td><td>25%</td></tr> </table> | 100% - 99.9% | 0% | <99.9% - 99.5% | 2% | <99.5% - 97% | 3% | <97 - 90% | 20% | <90% | 25% | |
| 100% - 99.9% | 0% | | | | | | | | | | | | | | | |
| <99.9% - 99.5% | 2% | | | | | | | | | | | | | | | |
| <99.5% - 97% | 3% | | | | | | | | | | | | | | | |
| <97 - 90% | 20% | | | | | | | | | | | | | | | |
| <90% | 25% | | | | | | | | | | | | | | | |

| No. | System Availability Standard | Relevant Performance Standard | Key Performance Area(s) | Measurement, in each case for the Month | Measure | SIM |
|-----|---|----------------------------------|-------------------------|---|-----------------|-----|
| 13 | Integrated Services APIs and Location Data APIs are operating in accordance with the Technical Requirements | No Relevant Performance Standard | 12 | Total Compliant Hours of the least available Integrated Services API plus the Total Compliant Hours of the Location Data API divided by the average Total Potential Hours of Availability the Integrated Services APIs plus the Total Compliant Hours for the Location Data API | 100% - 99.9% | 0% |
| | | | | | <99.9% - 99.5% | 2% |
| | | | | | <99.5% - 99% | 5% |
| | | | | | <99% | 10% |
| 14 | Reader APIs, Readers used for Expansion, and any implementation of the MBTA Fare Gate Interface Controller Board are implemented, maintained, and available in accordance with the Technical Requirements | No Relevant Performance Standard | 13 | Total hours in which all of (i) the Reader APIs, (ii) any Readers Used for Expansion, and (iii) any implementations of the MBTA Fare Gate Interface Controller Board are operating in accordance with the Technical Requirements, divided by the superset of Total Potential Hours of Availability for all such System Elements | 100% - 99.99% | 0% |
| | | | | | <99.99% - 99.9% | 2% |
| | | | | | <99.9% - 99% | 5% |
| | | | | | <99% - 95% | 10% |
| | | | | | <95% | 20% |
| 15 | Any External Interfaces are operating and maintained in accordance with the Technical Requirements | No Relevant Performance Standard | 28 | Total Compliant Hours for the least Available External Interface divided by the average Total Potential Hours of Availability for all External Interfaces | 100% - 99.5% | 0% |
| | | | | | <99.5% - 99% | 1% |
| | | | | | <99% - 95% | 5% |
| | | | | | <95% | 10% |

Table 3

Performance Standards, and Determination of Performance Failure Level and Performance Impact Ratchet

| No. | Performance Standard | Key Performance Areas | Performance Failure Level | | | |
|-----|--|-----------------------|---|---|--|---|
| | | | Level 1 | Level 2 | Level 3 | Level 4 |
| | | | Performance Impact Ratchet (PIR) | | | |
| | | | 1.0 | 1.5 | 2.0 | 4.0 |
| 1 | All Gates (and Readers contained within) are operating in accordance with the Technical Requirements | 18 | Failure not meeting the criteria of Levels 2, 3 and 4 | Any failure in respect of a Gate that is the only Gate at an entrance at a Location, and which failure does not meet the criteria of Level 4 Performance Impact Ratchet = 2.0. | Any failure to comply with Accessibility or safety requirements | |
| 2 | All Validators (and Readers contained within and inclusive of System Validation Equipment for Vehicle Validators) are operating in accordance with the Technical Requirements | 19, 20 | Failure not meeting the criteria of Levels 2, 3 and 4 | Any failure in respect of a Validator that is installed at the front door of a Light Rail Vehicle Performance Impact Ratchet = 2.0. | | |
| 3 | All Fare Vending Machines are operating in accordance with the Technical Requirements, subject to the exclusion of Limited-Functionality FVMs in the circumstances provided in Performance Standard 22 of this Table 3 | 21 | Failure not meeting the criteria of Levels 2, 3 and 4 | Any failure in respect of an FVM that is the only FVM at the Location, and which failure does not meet the criteria of Level 3 or Level 4 | FVM is unable to dispense Fare Cards (including because of lack of stock of Fare Cards), and failure does not meet the criteria of Level 4 | Any failure to comply with Accessibility or safety requirements |

| No. | Performance Standard | Key Performance Areas | Performance Failure Level | | | |
|-----|--|-----------------------|--|---|--|---|
| | | | Level 1 | Level 2 | Level 3 | Level 4 |
| | | | Performance Impact Ratchet (PIR) | | | |
| | | | 1.0 | 1.5 | 2.0 | 4.0 |
| 4 | Daily deposit of Revenue – 100% timely, accurate deposit of Fare Revenue by the SI and submission of reconciled back-up Data occur in accordance with the Contract Standards | 9 | 100% accurate and complete but not 100% timely | 100% timely but inaccurate by +/- 5% or less in comparison with the reconciled back-up Data | Not 100% timely, and inaccurate by +/- 5% or less in comparison with the reconciled back-up Data | Inaccurate by more than +/- 5% in comparison with the reconciled back-up Data |
| 5 | Fare calculation – 100% of Fares and other amounts charged (including for Products and Enablement Fees), and travel entitlements validated, are calculated and applied correctly, in accordance with Fare Policy and Configuration, documented with supporting Data, and applied in accordance with the timeframes set forth in the Technical Requirements | 7 | Inaccurate by +/- 10% or less | Inaccurate by more than +/- 10% Performance Impact Ratchet = 4.0. | | |

| No. | Performance Standard | Key Performance Areas | Performance Failure Level | | | |
|-----|--|-----------------------|--|--|--|---|
| | | | Level 1 | Level 2 | Level 3 | Level 4 |
| | | | Performance Impact Ratchet (PIR) | | | |
| | | | 1.0 | 1.5 | 2.0 | 4.0 |
| 6 | All Configuration and change management is implemented on time and in all other ways in accordance with the Technical Requirements, including successful completion of testing | 6 | Failure relating to anything other than that identified in Levels 2, 3, and 4, including any Configuration requested not in respect of Fare Policy | Failure relating to Fare Policy or related Configuration not identified in Level 4 | Failure relating to Updates, Upgrades, or reconfiguration not in response to Configuration | Failure relating to Fare Policy and related Configuration changes with a published implementation date (including the date a change to Fare Policy takes effect on Users) |
| 7 | The Administrator Interfaces and all respective APIs are operating in accordance with the Technical Requirements. | 2 | Failure other than that identified in Level 4 Performance Impact Ratchet = 1.0. | | | Either the Customer Support Software or any of its respective APIs are unavailable for 80% or more of User requests |
| 8 | The Automated Monitoring Subsystem (AMS) is operating in accordance with the Technical Requirements | 3 | Performance Failure Level 1 for any Performance Failure Performance Impact Ratchet = 1.0. | | | |
| 9 | The System Website, the Fare Card Mobile Application (if used to provide access to Account management functionality) and the IVR and each of their respective APIs | 1 | Failure other than that identified in Level 4 Performance Impact Ratchet = 1.0. | | | Either the System Website or any of its respective APIs are unavailable for 80% or more of User requests |

| No. | Performance Standard | Key Performance Areas | Performance Failure Level | | | |
|-----|--|-----------------------|--|-----------------------------------|-----------------------------------|------------------------------|
| | | | Level 1 | Level 2 | Level 3 | Level 4 |
| | | | Performance Impact Ratchet (PIR) | | | |
| | | | 1.0 | 1.5 | 2.0 | 4.0 |
| | are operating in accordance with the Technical Requirements | | | | | |
| 10 | All System Elements and Operating Services in respect of (a) all requirements of Sections 5, 6, and 7 of Appendix 4.4 and (b) all requirements of Appendix 3.8 implemented using any System Element other than the Customer Support Software and the System Website are operating and performed in accordance with the referenced Technical Requirements | 2 | 1 – 100 Accounts impacted | >100 – 2,000 Accounts impacted | >2,000 – 50,000 Accounts impacted | >50,000 Accounts impacted |
| 11 | Customer-Facing Devices are kept in a state of reasonably clean appearance consistent with the Master Maintenance Plan and any requirements of Appendix 4.6 including properly affixed and readable labels and placards and ensuring that temporary repairs are not visible to Users | 23 | Performance Failure Level 1 for any Performance Failure Performance Impact Ratchet = 1.0. | | | |
| 12 | The Systems Integrator and the System are in compliance with | 10 | PCI-SSC standards | PCI-DSS standard – First Month of | PCI-DSS standard – Second Month | PCI-DSS standard – Third and |

| No. | Performance Standard | Key Performance Areas | Performance Failure Level | | | |
|-----|---|-----------------------|--|---|--|--|
| | | | Level 1 | Level 2 | Level 3 | Level 4 |
| | | | Performance Impact Ratchet (PIR) | | | |
| | | | 1.0 | 1.5 | 2.0 | 4.0 |
| | all PCI-SSC standards for which compliance is required by Appendix 3.1, at all times | | generally | failure | of failure | subsequent Month of failure |
| 13 | The Systems Integrator and the System are in compliance with all requirements set forth in Appendix 3.1, excluding those in respect of PCI-SSC standards, and with the network segmentation and isolation requirements of Appendix 2.5 | 11 | First Recurrence Period | Second Recurrence Period Performance Impact Ratchet = 1.5. | | Third and subsequent Recurrence Period |
| 14 | Order fulfilment services – All orders for Products and Fare Cards are fulfilled, managed, and tracked in accordance with the Technical Requirements | 8, 22 | 1 – 50 Users or Fare Cards impacted | 51 – 200 Users or Fare Cards impacted | 201 – 500 Users or Fare Cards impacted | 500+ Users or Fare Cards impacted |
| 15 | All Devices and SI Persons operating in or at any Location or Vehicle are operating safely and comply with Applicable Law in accordance with the Contract Standards, and the SI is in compliance with all safety requirements, including those set forth in Appendix 2.11 | 16 | Failure other than that identified in Level 4. Performance Impact Ratchet = 1.0. | | | Non-compliance with the safety requirements set forth in Appendix 2.11 of this Project Agreement |
| 16 | All Submittals to be provided in accordance with the Technical Requirements are | 5.1, 5.2 | Performance Failure Level 1 for any Performance Failure Performance Impact Ratchet = 1.0. | | | |

| No. | Performance Standard | Key Performance Areas | Performance Failure Level | | | |
|-----|--|-----------------------|--|--|---|---|
| | | | Level 1 | Level 2 | Level 3 | Level 4 |
| | | | Performance Impact Ratchet (PIR) | | | |
| | | | 1.0 | 1.5 | 2.0 | 4.0 |
| | delivered complete and timely | | | | | |
| 17 | All User and MBTA calls, emails and other notifications and correspondence to the SI in respect of the Key Performance Indicators are acknowledged, accurately recoded processed, and answered in accordance with the Technical Requirements | 4 | Performance Failure Level 1 for any Performance Failure Performance Impact Ratchet = 1.0. | | | |
| 18 | All Fare Cards are compliant with the characteristics and quality requirements set forth in Appendix 2.6 and Appendix 4.4 | 17 | 1 – 500 Fare Cards but not in respect of any Mobile Fare Card | 501 – 2000 Fare Cards but not in respect of any Mobile Fare Card | 2001 – 49,999 Fare Cards but not in respect of any Mobile Fare Card | 50,000+ Fare Cards, or in respect of any Mobile Fare Card |
| 19 | The Model Office , excluding Customer-Facing Devices, is operated and maintained in accordance with the Technical Requirements | 15 | Performance Failure Level 1 for any Performance Failure Performance Impact Ratchet = 1.0. | | | |
| 20 | All Taps stored in offline Readers and Inspection Devices are retrieved by the SI in accordance with the timescales and the Manual Retrieval requirements set forth in the Technical Requirements and reported in support of the deposit of Fare Revenue for the | 24 | Performance Failure Level 1 for any Performance Failure Performance Impact Ratchet = 1.0. | | | |

| No. | Performance Standard | Key Performance Areas | Performance Failure Level | | | |
|-----|---|-----------------------|---|--|--|---|
| | | | Level 1 | Level 2 | Level 3 | Level 4 |
| | | | Performance Impact Ratchet (PIR) | | | |
| | | | 1.0 | 1.5 | 2.0 | 4.0 |
| | relevant Operating Days. | | | | | |
| 21 | The System complies with the Account Data Timeliness Revenue Protection Standards for all triggering transactions and events | 14 | Failure not meeting the criteria of Levels 2, 3 and 4 | Failure to comply with Section 7.1.2 or 7.1.3 of Appendix 3.8 | Failure to comply with Section 7.1.6, 7.1.7, or 7.1.8 of Appendix 3.8 | Failure to comply with Section 7.1.1 or 7.1.4 of Appendix 3.8 |
| 22 | All Limited-Functionality FVMs have and can dispense sufficient change to be able to sell Products to Users in accordance with the Technical Requirements where the User is using cash to make a purchase | 21 | Failure not meeting the criteria of Levels 2, 3 and 4 | Can make change in all combinations for all amounts inserted except amounts greater than \$25 (Index Linked) | Cannot make change in all combinations for all amounts inserted <=\$25 Performance Impact Ratchet = 2.0 | |
| 23 | The Supplemental Monitoring Process is conducted in accordance with the Technical Requirements | 26 | First Recurrence Period | Second Recurrence Period | Third and subsequent Recurrence Period Performance Impact Ratchet = 4.0. | |
| 24 | All Inspection Devices (and Readers contained within) are operating in accordance with the Technical Requirements and are supported and serviced by the SI in accordance with the Technical Requirements | 25 | Failure not meeting the criteria of Levels 2, 3 and 4 | Failure relating to the availability of servicing and support requirements to the Inspection Device or Inspection Device User Performance Impact Ratchet = 2.0. | | |
| 25 | The Communications Networks requirements of Appendix 2.5 are met, except in respect of the | 27 | First Recurrence Period | Second Recurrence Period | Third and subsequent Recurrence Period Performance Impact Ratchet = 4.0. | |

| No. | Performance Standard | Key Performance Areas | Performance Failure Level | | | |
|-----|---|-----------------------|----------------------------------|---------|---------|---------|
| | | | Level 1 | Level 2 | Level 3 | Level 4 |
| | | | Performance Impact Ratchet (PIR) | | | |
| | | | 1.0 | 1.5 | 2.0 | 4.0 |
| | availability of the Communications Networks to interconnect other System Elements | | | | | |

Table 4

Key Performance Areas and Determination of PFDA, Cure Period, Recurrence Period, and Unit

| No. | Key Performance Area | Location Category, if applicable | PFDA (\$) | Unit | Cure Period | Recurrence Period (RP) |
|-----|--|----------------------------------|-----------|---|-----------------------|--------------------------|
| 1 | The System Website, IVR, and Fare Card Mobile Application (to the extent the latter is used to provide Account management functionality), their respective APIs, and all related Operating Services | | 5,000 | System | 3.5 hours | 30 minutes |
| 2 | The Administrator Interfaces, the related APIs, the related Operating Services, and all Operating Services involved in complying with all Account management and Account servicing requirements, including those set forth in Appendix 3.7, Appendix 3.8. and Appendix 4.4 | | 1,500 | System | 3.5 hours | 2 hours |
| 3 | The Automated Monitoring Subsystem and all related Operating Services | | 10,000 | System | 3.5 hours | 12 hours |
| 4 | The Performance Tracking System and all related Operating Services | | 500 | System | 3.5 hours | 12 hours |
| 5.1 | The Operating Services involved in delivering Submittals other than reports | | 3,000 | Submittal | 3 Business Days | 3 Business Days |
| 5.2 | The Operating Services involved in delivering Submittals which are reports | | 500 | Submittal | 24 hours | 24 hours |
| 6 | The Operating Services involved in fulfilling Configuration and change Management requirements, including those set forth in Appendix 4.3 | | 10,000 | Configuration request or Change or Update | See Note ² | Equal to the Cure Period |

² For any Configuration request, the Cure Period shall equal the lesser of 100% of the time allowed in Appendix 4.3 or eight (8) hours; for anything other than a Configuration request, the Cure Period shall equal eight (8) hours.

| No. | Key Performance Area | Location Category, if applicable | PFDA (\$) | Unit | Cure Period | Recurrence Period (RP) |
|-----|---|----------------------------------|-----------|---|------------------|------------------------|
| | | | | Upgrade | | |
| 7 | The System Elements and Operating Services involved in fulfilling requirements in respect of Fare calculation, charges to Users for Products and Enablement Fees, verification of travel entitlements, and charging Users any other amounts | | 25 | Fare charged or Product sold or amount charged | Zero | 12 hours |
| 8 | The Operating Services involved in meeting any order fulfilment requirements, including those set forth in Appendix 3.8 and Appendix 4.4 and Appendix 2.15 | | 500 | An order for Product(s) or Fare Card(s) | 24 hours | 24 hours |
| 9 | The Operating Services involved in ensuring compliant deposits of Fare Revenue occur, including as set forth in Appendix 4.2 | | 25,000 | A day for which a deposit of Fare Revenue is required | 24 hours | 12 hours |
| 10 | The Operating Services involved in ensuring compliance with PCI-SSC-related standards, including those set forth in Appendix 3.1 | | 75,000 | Project | 10 Business Days | 30 days |
| 11 | The Operating Services involved in ensuring compliance with all requirements set forth in Appendix 3.1 but excluding those in respect of PCI-SSC, and the network segmentation and isolation requirements of Appendix 2.5 | | 10,000 | Project | 20 Business Days | 30 days |
| 12 | The Integrated Services APIs and Location Data APIs and all related Operating Services | | 1,500 | A named API | 3.5 hours | 30 minutes |
| 13 | The Reader APIs, Readers used for Expansion, any implementation of the MBTA Fare Gate Interface Controller Board, and all related Operating Services | | 1,500 | Reader or ICB | 3.5 hours | 30 minutes |
| 14 | The System Elements involved in ensuring compliance with the Account Data Timeliness Revenue Protection Standards and all related | | 400 | A triggering transaction or other triggering | None | 1 hour |

| No. | Key Performance Area | Location Category, if applicable | PFDA (\$) | Unit | Cure Period | Recurrence Period (RP) |
|-----|---|----------------------------------|-----------|--|----------------------|------------------------|
| | Operating Services | | | event, as defined in the Account Data Timeliness Standards | | |
| 15 | The Model Office and all related Operating Services, except for Customer-Facing Devices | | 2,000 | Project | 6 hours | 8 hours |
| 16 | The Operating Services involved in ensuring compliance with all requirements related to safety and Applicable Law, including as set forth in Appendix 2.11 | | 10,000 | Project | None | 24 hours |
| 17 | The System Elements and Operating Services involved in ensuring compliance with all requirements regarding Fare Card characteristics and quality, including as set forth in Appendix 2.6 and Appendix 4.4 | | 25,000 | System | 30 days | 24 hours |
| 18 | Gates (and Readers contained within) and all related Operating Services | A | 1,000 | Gate | 2 hours | 5 hours |
| | | B | 750 | Gate | 3 hours | 6 hours |
| | | C | 400 | Gate | 6 hours | 8 hours |
| | | D | 300 | Gate | 6 hours | 12 hours |
| 19 | Station Validators (and Readers contained within) and all related Operating Services | A | 650 | Validator | 2 hours ³ | 5 hours |
| | | B | 500 | Validator | 3 hours ³ | 6 hours |
| | | C | 300 | Validator | 6 hours | 8 hours |
| | | D | 150 | Validator | 6 hours | 12 hours |
| 20 | The Vehicle Validators (and Readers contained within), associated System Validation Equipment, and all related Operating Services on each Vehicle | | 125 | Validator | 4 hours ⁴ | 3 hours |

³ If only one (1) Station Validator at the Location is failing to comply with the Performance Standard, the Cure Period shall be 4 hours.

| No. | Key Performance Area | Location Category, if applicable | PFDA (\$) | Unit | Cure Period | Recurrence Period (RP) |
|-----|---|----------------------------------|-----------|-------------------|----------------------|------------------------|
| 21 | Fare Vending Machines and all related Operating Services | A | 750 | FVM | 2 hours ⁵ | 5 hours |
| | | B | 450 | FVM | 3 hours ⁵ | 6 hours |
| | | C | 300 | FVM | 6 hours | 8 hours |
| | | D | 200 | FVM | 6 hours | 12 hours |
| 22 | Each Retail Reload Location, Administrative Point of Sales, and all related Operating Services | | 500 | Location | 4 hours | 8 hours |
| 23 | The Operating Services involved in ensuring that each Device complies with the requirements in respect of maintaining reasonably clean appearance, including all those set forth in Appendix 4.6 and as per the Preventative Maintenance Plan | | 200 | Device | 4 days | 2 days |
| 24 | The Operating Services involved in the Manual Retrieval of Taps from Offline Readers and Inspection Devices to comply with the Technical Requirements | | 3,000 | Device | Zero | 24 hours |
| 25 | Inspection Devices (and Readers contained within) and all related Operating Services | | 250 | Inspection Device | 30 minutes | 12 hours |
| 26 | The System Elements and Operating Services involved in ensuring compliance with the requirements in respect of the Supplemental Monitoring Process | | 10,000 | Project | 10 Business Days | 30 days |
| 27 | The Operating Services and System Elements involved in complying with the Communications Networks requirements set forth in Appendix 2.5, except only in respect of the availability of the | | 5,000 | Project | 10 Business Days | 30 days |

⁴ If only one (1) Vehicle Validator on the Vehicle is failing to comply with the Performance Standard, the Cure Period shall extend to end one (1) hour before the start of the Operating Day immediately following the Operating Day during which the failure to comply with the Performance Standard occurred.

⁵ If only one (1) FVM at the Location is failing to comply with the Performance Standard, the Cure Period shall be 4 hours.

| No. | Key Performance Area | Location Category, if applicable | PFDA (\$) | Unit | Cure Period | Recurrence Period (RP) |
|-----|---|----------------------------------|-----------|--------------------|-------------|------------------------|
| | Communications Networks to interconnect other System Elements | | | | | |
| 28 | The External Interfaces and all related Operating Services | | 0 | External Interface | N/A | N/A |

Table 5
Location Categories

| Locations – Category A | |
|------------------------|----------------------|
| Back Bay | Haymarket |
| Central Square | Kendall Square |
| Charles MGH | Malden Center |
| Copley Square | North Station |
| Davis Square | Park Street |
| Downtown Crossing | South Station |
| Forest Hills | State Street |
| Harvard | |
| Locations – Category B | |
| Airport | Kenmore Square |
| Alewife | Lechmere |
| Andrew Square | Maverick |
| Arlington | North Quincy |
| Ashmont | Oak Grove |
| Boylston | Porter Square |
| Chinatown | Quincy Center |
| Government Center | Ruggles |
| Hynes | Sullivan Square |
| JFK/UMass | Wellington |
| Locations – Category C | |
| Anderson /Woburn | Norwood Central |
| Aquarium | Orient Heights |
| Attleboro | Providence |
| Beachmont | Prudential |
| Beverly | Quincy Adams |
| Braintree | Reading |
| Broadway | Revere Beach |
| Canton Junction | Route 128 |
| Chelsea | Roxbury Crossing |
| Community College | Salem |
| Fairmount | Sharon |
| Fields Corner | South Attleboro |
| Four Corners / Geneva | Stony Brook |
| Framingham | Talbot Avenue |
| Green Street | Tufts Medical Center |
| Jackson Square | Uphams Corner |
| Lowell | West Medford |
| Mansfield | Wollaston |
| Mass Ave | Wonderland |

| | |
|--|--------------------|
| Morton Street | Worcester |
| Newmarket | Yawkey |
| Each Location necessary to meet the FVM Required Locations Coverage Principle in Appendix 2.10 | |
| Blue Hill Avenue Station (Planned Expansion) | |
| Each Station of the Silver Line Gateway project (Planned Expansion) | |
| Each Station of the Green Line Extension project (Planned Expansion) | |
| Model Office | |
| Locations – Category D | |
| Abington | Needham Heights |
| Andover | Needham Junction |
| Ashland | Newburyport |
| Assembly Square | Newtonville |
| Auburndale | Norfolk |
| Ayer | North Beverly |
| Ballardvale | North Billerica |
| Bellevue | North Leominster |
| Belmont | North Scituate |
| Beverly Farms | North Wilmington |
| Boston Landing | Norwood Depot |
| Bowdoin | Plimptonville |
| Bradford | Plymouth |
| Brandeis/Roberts | Prides Crossing |
| Bridgewater | Readville |
| Brockton | Riverside |
| Campello | Riverworks |
| Canton Center | Rockport |
| Cohasset | Roslindale Village |
| Concord | Rowley |
| Courthouse | Savin Hill |
| Dedham Corp Ctr. | Science Park |
| East Weymouth | Shawmut |
| Endicott | Shirley |
| Fitchburg | Silver Hill |
| Forge Park/495 | South Acton |
| Foxboro | South Weymouth |
| Franklin/Dean College | Southborough |
| Gloucester | Stoughton |
| Grafton | Suffolk Downs |
| Greenbush | Swampscott |
| Greenwood | Symphony |

| | |
|---|--------------------|
| Halifax | TF Green Airport |
| Hamilton-Wenham | Wachusett |
| Hanson | Wakefield |
| Hastings | Walpole |
| Haverhill | Waltham |
| Hersey | Waverley |
| Highland | Wedgemere |
| Holbrook/Randolph | Wellesley Farms |
| Hyde Park | Wellesley Hills |
| Ipswich | Wellesley Square |
| Islington | West Concord |
| Kendal Green | West Gloucester |
| Kingston | West Hingham |
| Lawrence | West Natick |
| Lincoln | West Newton |
| Littleton/495 | West Roxbury |
| Lynn | Westborough |
| Manchester | Weymouth Landing |
| Melrose Cedar Park | Whitman |
| Melrose Highlands | Wickford Junction |
| Middleborough/Lakeville | Wilmington |
| Mishawum | Winchester Center |
| Montello | Windsor Gardens |
| Montserrat | Wood Island |
| Nantasket Junction | World Trade Center |
| Natick | Wyoming Hill |
| Needham Center | |
| Each Location necessary to meet the POS Required Locations Coverage Principle and the Distributed Locations Coverage Principle in Appendix 2.10 | |

Table 6
AP O&M by Month and Fiscal Year (Real \$)

| Fiscal Year | July | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
|-------------|------|-----|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2018 | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | |
| 2020 | | | | | | | | | | 6 | | |
| 2021 | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | |
| 2026 | | | [Inputs to be calculated based on Systems Integrator Proposal to be updated based on the Notice to Award Date. All periods are to reflect a full Month and may be pro-rated within the Monthly Payment calculation worksheet.] | | | | | | | | | |
| 2027 | | | | | | | | | | | | |
| 2028 | | | | | | | | | | | | |
| 2029 | | | | | | | | | | | | |
| 2030 | | | | | | | | | | | | |
| 2031 | | | | | | | | | | | | |
| 2032 | | | | | | | | | | | | |
| 2033 | | | | | | | | | | | | |
| 2034 | | | | | | | | | | | | |
| 2035 | | | | | | | | | | | | |
| 2036 | | | | | | | | | | | | |
| 2037 | | | | | | | | | | | | |
| 2038 | | | | | | | | | | | | |
| 2039 | | | | | | | | | | | | |
| 2040 | | | | | | | | | | | | |
| 2041 | | | | | | | | | | 7 | | |

⁶ To the extent that the Revenue Service Commencement Date is achieved prior to the date assumed in the Financial Model, the APO payable (subject to inflation and adjustment in accordance with the Monthly Payment calculation worksheet) shall equal the average for the five (5) complete Fiscal Years from the Scheduled Full Service Commencement Date. These amounts are to be populated within Table 6

⁷ To the extent a Compensation Event results in an increase to the Term, the additional Month(s)'s APO shall be the calculated pursuant to Section 13.5 of the Project Agreement.

Table 7

Total AP Transaction Rates based on MBTA Fare Revenue

| | Transaction Channel | Sources for MBTA Fare Revenue distribution by Transaction Channel | Allowable AP Transaction Rate (%) | Other AP Transaction Rate (%) | Total AP Transaction Rate (%) (APT _{cr}) |
|---|-------------------------|---|-----------------------------------|-------------------------------|--|
| | | | (A) | (B) | (C)=(A)+(B) |
| a | Bulk | ACH, check, or wire transfer and including any payments to an API Funds Pool or an APOS Funds Pool | | | |
| b | PAYG Debit | Any Payment Card which is classified as a debit card by Payment Industry Standards, presented via Tap (directly or using an NFC Device) or in the Fare Card Mobile Application (when the payment made using the Fare Card Mobile Application is considered made in a “card present” manner by Payment Industry Standards) | | | |
| c | PAYG Credit | Any Payment Card which is classified as a credit card by Payment Industry Standards, presented via Tap (directly or using an NFC Device) or in the Fare Card Mobile Application (when the payment made using the Fare Card Mobile Application is considered made in a “card present” manner by Payment Industry Standards) | | | |
| d | Card Not Present Debit | Any Payment Card which is classified as a debit card by Payment Industry Standards, used on the System Website, IVR, the Fare Card Mobile Application (when the payment using the Fare Card Mobile Application is considered made in a “card not present” manner by Payment Industry Standards), and via any automatic renewal or top-up features (as described in Appendix 3.8). | | | |
| e | Card Not Present Credit | Any Payment Card which is classified as a credit card by Payment Industry Standards, used on the System Website, IVR, the Fare Card Mobile Application (when the payment | | | |

| | Transaction Channel | Sources for MBTA Fare Revenue distribution by Transaction Channel | Allowable AP Transaction Rate (%) | Other AP Transaction Rate (%) | Total AP Transaction Rate (%) (APT _{cr}) |
|---|-----------------------------|---|-----------------------------------|-------------------------------|--|
| | | | (A) | (B) | (C)=(A)+(B) |
| | | using the Fare Card Mobile Application is considered made in a “card not present” manner by Payment Industry Standards), and via any automatic renewal or top-up features (as described in Appendix 3.8). | | | |
| f | FVM – In Station Debit | Any Payment Card which is classified as a debit card by Payment Industry Standards, used at an FVM located at a Station | | | |
| g | FVM – In Station Credit | Any Payment Card which is classified as a credit card by Payment Industry Standards, used at an FVM located anywhere other than a Station | | | |
| h | FVM – In Station Cash | Cash used at any FVM located in a Station | | | |
| i | FVM – Out of Station Debit | Any Payment Card which is classified as a debit card by Payment Industry Standards, used at an FVM located at a Station | | | |
| j | FVM – Out of Station Credit | Any Payment Card which is classified as a credit card by Payment Industry Standards, used at an FVM located anywhere other than a Station | | | |
| k | FVM – Out of Station Cash | Cash used at an FVM located anywhere other than a Station | | | |
| l | Retail Reload Location | Any purchase by a User at a Retail Reload Location | | | |

Table 8

Total AP Transaction Rates based on Transaction Units

| | Transaction Channel | Constitution of One (1) Transaction Unit | Allowable AP Transaction Rate (\$ per Transaction Unit) | Other AP Transaction Rate (\$ per Transaction Unit) | Total AP Transaction Rate (\$ per Transaction Unit) |
|---|---------------------|--|---|---|---|
| | | | (A) | (B) | (C)=(A)+(B) |
| a | Bulk | One (1) payment for Products or Value using ACH, check, or wire transfer and including any payments to an API Funds Pool or an APOS Funds Pool | | | |
| b | PAYG Debit | One (1) Trip with an accepted Tap using a Contactless EMV Credential which is classified as a debit card by Payment Industry Standards, or one (1) transaction per Product successfully purchased using the Fare Card Mobile Application paid for with a Payment Card which is classified as a debit card by Payment Industry Standards, when the payment for that Product is considered made in a “card present” manner by Payment Industry Standards | | | |
| c | PAYG Credit | One (1) Trip with an accepted Tap using a Contactless EMV Credential which is classified as a credit card by Payment Industry Standards, or one (1) transaction per Product successfully purchased using the Fare Card Mobile Application paid for with a Payment Card which is classified as a credit card by Payment Industry Standards, when the payment for that Product is considered made in a “card present” manner by Payment Industry Standards | | | |
| d | Card Not Present | One (1) User Session in the System Website, IVR or Fare Card Mobile Application (when the payment using the Fare | | | |

| | Transaction Channel | Constitution of One (1) Transaction Unit | Allowable AP Transaction Rate (\$ per Transaction Unit) | Other AP Transaction Rate (\$ per Transaction Unit) | Total AP Transaction Rate (\$ per Transaction Unit) |
|---|-------------------------|--|---|---|---|
| | | | (A) | (B) | (C)=(A)+(B) |
| | Debit | Card Mobile Application is considered made in a “card not present” manner by Payment Industry Standards) that includes the successful paid purchase of a Product paid for with a Payment Card which is classified as a debit card by Payment Industry Standards, or one (1) successful paid purchase of a Product via automatic top-up or renewal (as described in Appendix 3.8) paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | | | |
| e | Card Not Present Credit | One (1) User Session in the System Website, IVR or Fare Card Mobile Application (when the payment using the Fare Card Mobile Application is considered made in a “card not present” manner by Payment Industry Standards) that includes the successful paid purchase of a Product paid for with a Payment Card which is classified as a credit card by Payment Industry Standards, or one (1) successful paid purchase of a Product via automatic top-up or renewal (as described in Appendix 3.8) paid for with a Payment Card which is classified as a credit card by Payment Industry Standards | | | |
| f | FVM – In Station Debit | One (1) User Session at an FVM located in a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | | | |
| g | FVM – In Station | One (1) User Session at an FVM located in a Station that includes a successful paid purchase of one or more | | | |

| | Transaction Channel | Constitution of One (1) Transaction Unit | Allowable AP Transaction Rate (\$ per Transaction Unit) | Other AP Transaction Rate (\$ per Transaction Unit) | Total AP Transaction Rate (\$ per Transaction Unit) |
|---|--------------------------------|---|---|---|---|
| | | | (A) | (B) | (C)=(A)+(B) |
| | Credit | Products or payment of one or more Enablement Fees, paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | | | |
| h | FVM – In Station Cash | One (1) User Session at an FVM located in a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with cash | | | |
| i | FVM – Out of Station Debit | One (1) User Session at an FVM located anywhere other than a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | | | |
| j | FVM – Out of Station Credit | One (1) User Session at an FVM located anywhere other than a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with a Payment Card which is classified as a debit card by Payment Industry Standards | | | |
| k | FVM – Out of Station Cash | One (1) User Session at an FVM located anywhere other than a Station that includes a successful paid purchase of one or more Products or payment of one or more Enablement Fees, paid for with cash | | | |
| l | Retail Reload Location | One (1) User Session at a Retail Reload Location with a successful paid purchase of one or more Products or payment of one or more Enablement Fees. | | | |
| m | Standard Fare Card Enablements | One (1) Standard Fare Card which is Enabled by way of a User paying the Enablement Fee Configured by MBTA, or One (1) Standard Fare Card which is Enabled by way of the | | | |

| | Transaction Channel | Constitution of One (1) Transaction Unit | Allowable AP Transaction Rate (\$ per Transaction Unit) | Other AP Transaction Rate (\$ per Transaction Unit) | Total AP Transaction Rate (\$ per Transaction Unit) |
|---|---------------------------------|--|---|---|---|
| | | | (A) | (B) | (C)=(A)+(B) |
| | | MBTA waiving the Enablement Fee, or One (1) Standard Fare Card which is Enabled by way of Fare Policy and Configuration allowing the transfer of an Enabled status from one Fare Card to another. | | | |
| n | Temporary Fare Card Enablements | One (1) Temporary Fare Card which is Enabled by way of a User paying the Enablement Fee Configured by MBTA, or One (1) Temporary Fare Card which is Enabled by way of the MBTA waiving the Enablement Fee, or One (1) Temporary Fare Card which is Enabled by way of Fare Policy and Configuration allowing the transfer of an Enabled status from one Fare Card to another. | [•] ⁸ | [•] ⁸ | |

⁸ The Temporary Fare Card Enablements Allowable AP Transaction Rate, Other AP Transaction Rate and Total AP Transaction Rate will be populated upon the Effective Date at 25% of the corresponding Standard Fare Card Enablements rate, rounded up to the nearest 1 cent.

Monthly Payment Calculation Worksheet

| | |
|-----------|-------------|
| Month End | Fiscal Year |
|-----------|-------------|

Not for use for a Month during which any Termination occurs

Check box for each of these Key Milestones achieved during or before this Month:

If respective box is not checked, leave blank:

Enter days in this month (not when payment is being calculated) falling on or after each date in 2b-4b, or -0-

| | | | | | | |
|-----------------------------|-----|--------------------------|---|-----|----------------------|-----|
| Milestones Achieved | 1 | <input type="checkbox"/> | Pilot Phase 1. If not checked, do not complete this form. | | | |
| | 2 a | <input type="checkbox"/> | Revenue Service Commencement. Enter Revenue Service Commencement Date in line 2b. | 2 b | <input type="text"/> | 2 c |
| | 3 a | <input type="checkbox"/> | Transition Period Completion. Enter Transition Period Completion Date in line 3b. | 3 b | <input type="text"/> | 3 c |
| | 4 a | <input type="checkbox"/> | Full Service Commencement. Enter Full Service Commencement Date in line 4b. | 4 b | <input type="text"/> | 4 c |
| Payment Factors | 5 a | | Enter the Inflation Index for the most recent available December which occurs before the start of the Fiscal Year. | | | 5 a |
| | b | | Inflation Factor. Divide line 5a by 241.432. (8 Decimal Places) | | | b |
| | 6 a | | Enter the number of days in Month. | | | 6 a |
| | b | | Portion of Month on or after Revenue Service Commencement Date. Divide line 2c by line 6a. (8 Decimal Places) | | | b |
| | c | | Portion of Month on or after Transition Period Completion Date. Divide line 3c by line 6a. (8 Decimal Places) | | | c |
| | d | | Portion of Month on or after Full Service Commencement Date. Divide line 4c by line 6a. (8 Decimal Places) | | | d |
| | 7 | | APO factor 1 (Starting from Revenue Service Commencement Date). Multiply line 6b by 0.33. (8 Decimal Places) | | | 7 |
| | 8 | | APO factor 2 (Starting from Transition Period Completion Date). Multiply line 6c by 0.33. (8 Decimal Places) | | | 8 |
| | 9 | | APO factor 3 (Starting from Full Service Commencement Date). Multiply line 6d by 0.34. (8 Decimal Places) | | | 9 |
| | 10 | | APC factor 1 (Starting from Transition Period Completion Date). Multiply line 6c by 0.5. (8 Decimal Places) | | | 10 |
| | 11 | | APC factor 2 (Starting from Full Service Commencement Date). Multiply line 6d by 0.5. (8 Decimal Places) | | | 11 |
| Base Monthly Payment | 12 | | APC basis. Enter APC if Month is during the Initial Term, otherwise enter -0-. (2 Decimal Places) | | | 12 |
| | 13 | | AP Capital from Transition Period Completion Date. Multiply line 10 by line 12 (2 Decimal Places) | | | 13 |
| | 14 | | AP Capital from Full Service Commencement Date. Multiply line 11 by line 12 (2 Decimal Places) | | | 14 |
| | 15 | | Total AP Capital. Add lines 13 and 14. | | | 15 |
| | 16 | | APO basis. Enter amount from Appendix 8, Table 6 for this Month. (2 Decimal Places) | | | 16 |
| | 17 | | AP O&M from Revenue Service Commencement Date. Multiply line 7 by line 16. (2 Decimal Places) | | | 17 |
| | 18 | | AP O&M from Transition Period Completion Date. Multiply line 8 by line 16. (2 Decimal Places) | | | 18 |
| | 19 | | AP O&M from Full Service Commencement Date. Multiply line 9 by line 16. (2 Decimal Places) | | | 19 |
| | 20 | | Total AP Operating, unadjusted. Add lines 17 through 19. | | | 20 |
| | 21 | | Total AP Operating, adjusted for Inflation Factor. Multiply line 20 by line 5b. (2 Decimal Places) | | | 21 |
| | 22 | | Base Monthly Payment. Add lines 15 and 21. | | | 22 |

| | | | | | | | | |
|-------------------|------|--|--|---|---|--|---|--|
| Deductions | 23 | System Impact Multiplier for the Month... For System Availability Standard... As determined per Section 2 of Appendix 8: | 24 | Multiply each value in line 23a through 23i by line 22 to 2 (2 Decimal Places): | 25 | Total of Performance Deductions for the Month... For Performance Standard... As determined per Section 3 of Appendix 8 (2 Decimal Places): | 26 | Performance Deductions adjusted for inflation. Multiply each value in line 25a through 25i by line 5b. (2 Decimal Places): |
| | | 1 a | | a | 1 a | | a | |
| | | 2 b | | b | 2 b | | b | |
| | | 3 c | | c | 3 c | | c | |
| | | 4 d | | d | 4 d | | d | |
| | | 5 e | | e | 5 e | | e | |
| | | 6 f | | f | 6 f | | f | |
| | | 7 g | | g | 7 g | | g | |
| | | 8 h | | h | 8 h | | h | |
| | | 9 i | | i | 9 i | | i | |
| | | 27 | System Impact Multiplier for the Month... For System Availability Standard... As determined per Section 2 of Appendix 8: | 28 | Multiply each value in line 27a through 27f by line 22. (2 Decimal Places): | 29 | Total of Performance Deductions for the Month... For Performance Standard... As determined per Section 3 of Appendix 8. (2 Decimal Places): | 30 |
| | 10 a | | a | 10 a | | a | | |
| | 11 b | | b | 11 b | | b | | |
| | 12 c | | c | 12 c | | c | | |
| | 13 d | | d | 13 d | | d | | |
| | 14 e | | e | 14 e | | e | | |
| | 15 f | | f | 15 f | | f | | |
| | 16 g | | g | 16 g | | g | | |
| | 18 h | | h | 18 h | | h | | |
| | 19 i | | i | 19 i | | i | | |
| | 20 j | | j | 20 j | | j | | |
| | 21 k | | k | 21 k | | k | | |
| | 22 l | | l | 22 l | | l | | |
| | 23 m | | m | 23 m | | m | | |
| | 24 n | | n | 24 n | | n | | |
| | 25 o | | o | 25 o | | o | | |
| | 31 | Paired Deductions for the Month. Enter the greater of each respective value between line 24a through 24i and line 26a through 26i: | 32 | Add all values in line 28a through 28f. | 34 | Add all values in line 30a through 30o. | 35 | Calculated Deductions for the Month. Add lines 32, 33, and 34: |
| | a | | | | | | | |
| | b | | | | | | | |
| | c | | | | | | | |
| | d | | | | | | | |
| | e | | | | | | | |
| | f | | | | | | | |
| | g | | | | | | | |
| | h | | | | | | | |
| | i | | | | | | | |

| | | | |
|------------------------------|--|---|----|
| Deduction Adjustments | 36 | Enter MBTA disputed Deduction amount. Positive value indicates amount of Deduction MBTA asserts is missing from line 35 (2 Decimal Places): | 36 |
| | 37 | Full Deduction including MBTA disputed amount. Add line 35 and line 36; if result is negative, enter -0-. | 37 |
| | 38 | Deductions Cap. Multiply line 22 by 0.5 (2 Decimal Places) | 38 |
| | 39 | Capped Deductions. Insert the lower of line 37 and Line 38 | 39 |
| | 40 | Enter amount of Deductions to apply retroactively from prior Months as set forth in Appendix 8, Section 1.2 (2 Decimal Places): | 40 |
| 41 | Total Deductions applicable to Monthly Payment. Add line 39 and 40 | 41 | |

Worksheet data from prior Months

Names of the six prior Months, including the calendar year.

Table with 6 columns: Sixth prior Month, Fifth prior Month, Fourth prior Month, Third prior Month, Second prior Month, Prior Month. Includes rows 42 and 43 for Normalized Deduction rate and Applied Deductions.

Earn Backs

Table for Earn Backs calculations, including rows 44-49. Includes a table for 'Then enter...' with values 1.00, 0.25, 0.10, 0.05, 0.02, 0.01.

AP Transaction Based on MBTA Fare Revenue

Table for AP Transaction Based on MBTA Fare Revenue, including rows 50-54. Includes a table for 'Then enter...' with values 1.00, 0.25, 0.10, 0.05, 0.02, 0.01.

AP Transaction Based on Transaction Units

Table for AP Transaction Based on Transaction Units, including rows 55-59. Includes a table for 'Then enter...' with values 1.00, 0.25, 0.10, 0.05, 0.02, 0.01.

| | | | | |
|--------------------------------|----|--|--|----|
| Availability Payment | 61 | Base Monthly Payment. Enter line 22. | | 61 |
| | 62 | Total AP Transactions. Enter line 60. | | 62 |
| | 63 | Total Earn Backs. Enter line 49. | | 63 |
| | 64 | Total AP before Deductions. Add line 61, line 62, and line 63. | | 64 |
| | 65 | Total Deductions. Enter line 41. | | 65 |
| | 66 | Availability Payment. If line 65 is greater than line 64, enter -0-, otherwise subtract line 65 from line 64. | | 66 |
| Communications Networks | 67 | Enter the Total MBTA Layer 2 Service Locations for the Month. | | 67 |
| | 68 | If line 67 is greater than -0-, multiply the MBTA Layer 2 Services Fixed Amount by line 5b, otherwise enter -0-. (2 Decimal Places) | | 68 |
| | 69 | Multiply the MBTA Layer 2 Services Variable Amount by line 5b. (2 Decimal Places) | | 69 |
| | 70 | MBTA Layer 2 Services variable component. Multiply line 69 by line 67. (2 Decimal Places) | | 70 |
| | 71 | Enter the MBTA Layer 2 Services Excess Amount (2 Decimal Places) | | 71 |
| | 72 | Total MBTA Layer 2 Services cost. Add line 68, line 70, and line 71. | | 72 |
| | 73 | Enter the Total Active Verizon Accounts (0 Decimal Places) | | 73 |
| | 74 | Enter the Verizon Monthly Service Fees for the Month (2 Decimal Places) | | 74 |
| | 75 | If line 73 is greater than or equal to the Minimum Verizon Devices, multiply the Verizon Credit Amount by line 5b, otherwise enter -0-. (2 Decimal Places) | | 75 |
| | 76 | Verizon/MBTA Contract cost. If line 75 is greater than line 74, enter -0-, otherwise subtract line 75 from line 74. | | 76 |
| | 77 | Total Communications Networks costs. Add line 72 and line 76. | | 77 |
| Invoice(s) | 78 | Monthly Payment. Add line 66 and line 77 <i>[To be developed by the Parties or incorporated as set forth in Appendix 8, Section 7]</i> | | 78 |

APPENDIX 9

HANDBACK REQUIREMENTS

1. Master Maintenance Plan

1.1 SI Obligation to Develop and Maintain

The Systems Integrator shall:

- 1.1.1 Develop, provide and maintain the Master Maintenance Plan for all System Elements in accordance with the Contract Standards, including the specific requirements set forth in this Appendix 9;
- 1.1.2 Keep the Master Maintenance Plan current and supply the MBTA with appropriate updates, supplements or revisions thereto annually or at any earlier time that a material change to the Master Maintenance Plan is made or required:
 - 1.1.2.1 In respect of any Change;
 - 1.1.2.2 In connection with any Joint Technical Review or Handback Inspection; or
 - 1.1.2.3 In accordance with Good Industry Practice; and
- 1.1.3 Ensure that each update of the Master Maintenance Plan preserves the standards set forth in the Master Maintenance Plan most recently accepted by the MBTA.

1.2 MBTA Review, Comment and Acceptance

The initial Master Maintenance Plan and each update thereto shall be subject to review, comment and acceptance by the MBTA, acting reasonably, in accordance with Appendix 7 (MBTA Review Procedures). The Systems Integrator shall obtain the MBTA's acceptance of the initial Master Maintenance Plan prior to the Revenue Service Commencement Date and shall provide the MBTA with not less than 30 days to review and comment on the initial Master Maintenance Plan and any update thereto. Notwithstanding any review and comment by, or discussion with, the MBTA, the Master Maintenance Plan shall remain at all times the responsibility of the Systems Integrator. Neither the review of or comment upon, nor the failure by the MBTA to review or comment upon, the Master Maintenance Plan shall:

- 1.2.1 Relieve the Systems Integrator of any of its responsibilities under this Project Agreement;
- 1.2.2 Be deemed to constitute a representation by the MBTA that maintaining the System Elements pursuant to the Master Maintenance Plan will cause the System to be in compliance with the Contract Standards; or
- 1.2.3 Impose any liability upon the MBTA.

1.3 Requirements for the Master Maintenance Plan.

The objective of the Master Maintenance Plan is to set forth the procedures necessary to maintain the System's operability, durability, and reliability throughout its projected functional life and to ensure that the System will be maintained in accordance with the Contract Standards and at a level adequate to achieve compliance with Handback Requirements on the Expiration Date. The Master Maintenance Plan shall, in accordance with Contract Standards:

- 1.3.1 Define the approach to and procedures for predictive and preventive maintenance, including in respect of each System Element:
 - 1.3.1.1 Standard preventive maintenance intervals;
 - 1.3.1.2 Frequency and triggers for each level and type of predictive and preventive maintenance;
 - 1.3.1.3 Approximate amount of time and effort required for each predictive and preventive maintenance level and type; and
 - 1.3.1.4 Parts and tools required for each predictive and preventive maintenance level and type;
- 1.3.2 Define the approach to and procedures for corrective maintenance, including:
 - 1.3.2.1 Response times and tasks in respect of specific System Elements; and
 - 1.3.2.2 Procedures for root cause analysis in respect of recurring Problems;
- 1.3.3 In respect of each Device, provide maintenance instructions, including, as applicable:
 - 1.3.3.1 Information necessary to properly assemble and install the Device, including:
 - 1.3.3.1.1 Alignment, clearances, tolerances, wiring diagrams, equipment exploded view drawings, listing of equipment components, and interfacing equipment requirements;
 - 1.3.3.1.2 The trade and skill level required to install the equipment;
 - 1.3.3.1.3 Any special rigging required to place the equipment; and
 - 1.3.3.1.4 Any special test equipment required to place the equipment in service;
 - 1.3.3.2 The manufacturer's schedule for routine preventive maintenance, calibration, lubrication, inspections, tests, and adjustments required to ensure proper and economical operation and to minimize corrective maintenance and repair;
 - 1.3.3.3 The manufacturer's projection of preventive maintenance man-hours on a daily, weekly, monthly, and annual basis, including required trades and skill

- levels required for performance of maintenance and the total time required to perform the work;
- 1.3.3.4 The manufacturer's troubleshooting guide and recommendations on procedures and instructions for correcting problems and making repairs;
 - 1.3.3.5 Step-by-step procedures to isolate the cause of typical malfunctions, describing clearly why the checkout is performed and what conditions are to be sought;
 - 1.3.3.6 A description of maintenance and operating tools, replacement parts and materials, including specified quantity of spare parts;
 - 1.3.3.7 Information available from the manufacturers to use in training personnel to maintain the equipment and systems properly;
 - 1.3.3.8 Information on test equipment required to perform specified tests or special tools needed for the maintenance and repair of components;
 - 1.3.3.9 Instructions related to when equipment is in operation, including lubrication requirements; and
 - 1.3.3.10 All warranty information, including effective warranty dates;
- 1.3.4 Define the approach to and procedures for performing all Software maintenance in accordance with the Contract Standards;
 - 1.3.5 Include the practices and procedures necessary in accordance with the Contract Standards for:
 - 1.3.5.1 The maintenance of all CN Equipment;
 - 1.3.5.2 The manual retrieval of Taps from offline Readers and Inspection Devices;
 - 1.3.5.3 The maintenance and servicing of Inspection Devices;
 - 1.3.5.4 Maintaining the appearance of the System Elements to preserve aesthetics and protect against deterioration;
 - 1.3.6 Address procurement procedures for all additional tools, equipment, spare parts, maintenance supplies and consumables necessary for the operations and maintenance of the System and the performance of the Contract Services, including specifications and quantity of the items to be procured and procedures for planning and scheduling delivery of such items;
 - 1.3.7 Address emergency procurement procedures to enable timely replacement and response to the unexpected failure of any System Element;
 - 1.3.8 Address the development of asset records and the means to assess equipment condition in coordination with the AMS;

- 1.3.9 Include an asset life cycle and rehabilitation plan for the System, including specific refurbishment and replacement strategies, key assumptions and other provisions for all System Elements and the methods and practices by which the Systems Integrator will:
 - 1.3.9.1 Ensure the long-term integrity and reliability of the System;
 - 1.3.9.2 Preserve the design and performance criteria for all aspects of the System, as established by the Technical Requirements; and
 - 1.3.9.3 Ensure that on the Expiration Date all System Elements are functional to the standard specified in the Handback Requirements; and
- 1.3.10 Address coordination with the MBTA in respect of all maintenance activities, including:
 - 1.3.10.1 Measures to avoid disruption of or interference with MBTA Activities, including procedures for the establishment of scheduled downtime;
 - 1.3.10.2 Coordination in respect of MBTA-Provided Facilities;
 - 1.3.10.3 Procedures for scheduling and gaining access to Locations;
 - 1.3.10.4 Procedures for locating and securing access to Vehicles; and
 - 1.3.10.5 Responsibilities and procedures in respect of maintenance of System Elements that may be affected by MBTA Activities at Locations in respect of Location maintenance, User notification and advertising, including responsibilities and procedures associated with the placement and removal of stickers by MBTA Persons on and from System Elements.

2. Handback Requirements

2.1 Obligations on Expiration Date

Without limiting any other obligation of the Systems Integrator under this Project Agreement, the Systems Integrator shall ensure that, on the Expiration Date:

- 2.1.1 The System is in full compliance with the Contract Standards, including the Payment Industry Standards, and in a condition which is consistent with the Systems Integrator having performed the Operating Services in accordance with the Contract Standards, including all maintenance required by the Master Maintenance Plan;
- 2.1.2 Without limiting Section 2.1.1, above, all Customer-Facing Devices, Readers, and components of CN Equipment (the “**Residual Elements**”) are:
 - 2.1.2.1 Presentable and functional in accordance with all applicable Technical Requirements; and
 - 2.1.2.2 Capable of continued functionality in accordance with their design assuming a successor to the Systems Integrator performs continued operations and

maintenance in accordance with the Master Maintenance Plan and Good Industry Practice;

- 2.1.3 The Application Programming Interfaces (APIs) allow use of System functionality in accordance with the Contract Standards through the use of software and devices not provided by the Systems Integrator, as demonstrated by the Systems Integrator within the 60 days preceding the Expiration Date;
- 2.1.4 The Systems Integrator has provided the MBTA with sufficient spare parts to enable the MBTA to maintain each Customer-Facing Device for not less than two years following the Expiration Date;
- 2.1.5 In respect of Customer-Facing Devices, subject to Section 2.2:
 - 2.1.5.1 No Customer-Facing Device contains hardware or software that has a “Not Recommended for New Deployment,” “End of Life” or similar status;
 - 2.1.5.2 All components and sub-assemblies used in any Customer-Facing Device are available for sale;
 - 2.1.5.3 All Customer-Facing Devices are using versions of operating system software and patches supported by the manufacturers of such software and patches; and
 - 2.1.5.4 The Systems Integrator has provided to the MBTA an option to purchase (such option to be executed by the applicable Project Contractor in favor of the MBTA):
 - 2.1.5.4.1 Subcomponent parts of all Customer-Facing Devices from the applicable Project Contractor at the prices set forth in Attachment 9-A (Index Linked) for a period of five years following the Expiration Date;
 - 2.1.5.4.2 Any required engineering, labor or other related services as may be required to implement the replacement of a Customer Facing Device’s subcomponent at the Unit Rates indicated in Attachment 9-B (Index Linked) for a period of five years following the Expiration Date; and
 - 2.1.5.4.3 At no additional cost to the MBTA, a standard one-year limited warranty (effective from the date of delivery to the MBTA) for each Customer-Facing Device subcomponent purchased through such option;
- 2.1.6 The Systems Integrator has provided the MBTA with an updated life cycle plan forecasting end of life and migration paths for subcomponent replacement;
- 2.1.7 All Handback Work identified as needing to be performed in accordance with the most recently approved Handback Inspection Report has been completed;
- 2.1.8 All equipment logs, manuals, drawings, files, specifications and software licenses required to be provided to the MBTA in accordance with this Project Agreement have been provided to the MBTA in accordance with this Project Agreement,

including:

- 2.1.8.1 Compliance with all requirements specified in Article 16 (Intellectual Property Rights) and Sections 24.9 and 24.10 of the Project Agreement; and
- 2.1.8.2 An updated, detailed accounting of all COTS software versions, installations, licenses and configurations associated with the System.

2.2 Handback Warranty

Without limiting any other Handback Requirement, the Systems Integrator shall have the option, applicable to each Customer-Facing Device and at its discretion, to either (a) provide for compliance with Sections 2.1.5.1, 2.1.5.2 and 2.1.5.3 as of the Expiration Date, or (b) cause the Project Contractor primarily responsible for the performance of the Operating Services to provide the MBTA with a written limited warranty as of the Expiration Date in accordance with this Section 2.2 (a “**Handback Warranty**”). Any such Handback Warranty shall:

- 2.2.1 Warrant that any Customer-Facing Device subject to the Handback Warranty (for purposes of this Section 2.2, a “covered Customer-Facing Device”) will be capable of continued operations in accordance with the Technical Requirements and applicable Key Performance Indicators for a period of five years following the Expiration Date if such covered Customer-Facing Device is maintained by or on behalf of the MBTA in accordance with the normal maintenance requirements of the Master Maintenance Plan; and
- 2.2.2 Require that, in the event of a failure of any covered Customer-Facing Device to comply with such warranty during such period, the Project Contractor will, at no cost to the MBTA and in the minimum amount of time required under Good Industry Practice, respond to notice from the MBTA and correct such failure of compliance, including by making necessary repairs or replacements, in accordance with Good Industry Practice.

Any such Handback Warranty shall exclude remedy for damage or defect caused by:

- 2.2.3 Modifications to any covered Customer-Facing Device not undertaken by the Project Contractor during the warranty period;
- 2.2.4 The failure to maintain any covered Customer-Facing Device in accordance with the normal maintenance requirements of the Master Maintenance Plan during the warranty period;
- 2.2.5 The negligence or wilful misconduct of the MBTA or any MBTA Person in operating and maintaining the covered Customer-Facing Device; and
- 2.2.6 Normal wear and tear.

Any such Handback Warranty shall specifically identify all covered Customer-Facing Devices. Nothing in this Section is intended to limit the obligation of the Systems Integrator to comply with the obligation set forth in Section 2.1.5.4; provided that, the Parties acknowledge and agree that the MBTA will not be required to make any payment to the Project Contractor for repairs or replacements in respect of covered Customer-Facing Devices under, and during the period of, the Handback Warranty.

2.3 Independent Handback Consultant

The Systems Integrator shall appoint, and be solely responsible for the cost of, a suitably qualified and experienced consultant (or firm of consultants) to act as the independent consultant for the preparation of the Handback Plan, the conduct of all Handback Inspections and the preparation of all Handback Inspection Reports (the “**Independent Handback Consultant**”) in accordance with the terms and conditions of this Section 2.2. The Independent Handback Consultant and its scope of services shall be subject to the reasonable approval of the MBTA and shall be selected in a manner consistent with the procedures set forth in Appendix 8 (Payment Mechanism) in respect of any Independent Evaluator. The Systems Integrator shall obtain the MBTA’s approval of the Independent Handback Consultant no later than 34 Months prior to the Expiration Date. The Independent Handback Consultant shall be financially independent of all Systems Integrator Persons, shall owe a duty of care to both the MBTA and the Systems Integrator jointly and shall act impartially and independently of the MBTA and the Systems Integrator in the performance of its duties as contemplated in this Appendix 9. Without limiting any right otherwise provided to the MBTA hereunder in respect of the Proprietary Intellectual Property, the Independent Handback Consultant shall be provided access to Proprietary Intellectual Property to the extent necessary to perform the Handback Inspections, which access may, if requested by the Systems Integrator, be subject to commercially reasonable confidentiality restrictions to protect the confidentiality and proprietary nature of the Proprietary Intellectual Property. Nothing in this Project Agreement shall be interpreted as giving the Independent Handback Consultant any responsibility or authority for any aspect of the Contract Services, or as relieving the Systems Integrator of its responsibility for the Contract Services, and no Systems Integrator Person shall be entitled to rely on any advice or approvals that the Independent Handback Consultant may give with respect to the Project.

2.4 Handback Plan

The Systems Integrator shall prepare and, no later than 32 Months prior to the Expiration Date, shall submit to the MBTA for its review, comment and acceptance in accordance with Section 2.4 of this Appendix, a plan for the activities to be undertaken by the Systems Integrator in accordance with this Appendix in order to achieve compliance with the Handback Requirements as of the Expiration Date (the “**Handback Plan**”). The Handback Plan shall comply with the Contract Standards and shall:

- 2.4.1 Include a schedule specifying the dates of all activities to be undertaken by the Systems Integrator for the remainder of the Term to achieve compliance with the Handback Requirements as of the Expiration Date, including:
 - 2.4.1.1 All inspections, tests and reports;
 - 2.4.1.2 All updates to the Master Maintenance Plan to reflect each Handback Inspection; and
 - 2.4.1.3 All deliverables required in respect of each Handback Inspection and to satisfy the Handback Requirements as of the Expiration Date;
- 2.4.2 Detail the methodology and procedures to be used to determine compliance with the Handback Requirements specified in Sections 2.1.1, 2.1.2 and 2.1.3 of this Appendix, including:
 - 2.4.2.1 The scope of the inspections and tests proposed to be carried out;

- 2.4.2.2 The evaluation criteria to be adopted for the condition of the Residual Elements, which shall include:
 - 2.4.2.2.1 In respect of each Residual Element, consideration of ability to perform its intended function, its performance history, physical condition, availability and maintenance costs; and
 - 2.4.2.2.2 All other assessment procedures specified in the most recently accepted Master Maintenance Plan;
 - 2.4.2.3 The procedures to ensure that all inspection and testing is in conformance with:
 - 2.4.2.3.1 Good Industry Practice, including all technological advancements in the field of inspection and testing of similar assets; and
 - 2.4.2.3.2 Any applicable inspection manuals, guidance, standards or testing and forecasting methodologies issued by any MBTA Entity, and current at the time of inspection and testing, that detail the means and methods for inspecting and testing similar assets; and
 - 2.4.2.4 The procedures to ensure that the MBTA is provided the opportunity to witness all inspections and tests, including 15 Business Days prior written notice of each inspection and test; and
 - 2.4.2.5 A list of all proposed inspection and testing organizations, which shall be financially independent of all Systems Integrator Persons; and
- 2.4.3 Be accompanied by written confirmation from the Independent Handback Consultant as to compliance with the foregoing requirements.

2.5 MBTA Review, Comment and Acceptance of Handback Plan

The Handback Plan and any update thereto shall be subject to review, comment and acceptance by the MBTA, acting reasonably, in accordance with Appendix 7 (MBTA Review Procedures). The Systems Integrator shall obtain the MBTA's acceptance of the Handback Plan prior to the First Handback Inspection. In reviewing and commenting on the Handback Plan or any revision or update thereto, the MBTA shall be provided access to all of the Systems Integrator's records used in the preparation of the Handback Plan and not less than 30 days to provide a response.

2.6 Residual Element Condition Report

The Systems Integrator shall submit to the MBTA, at the same time it submits each Handback Inspection Report and subject to the same rights of review and approval, a report (a "**Residual Element Condition Report**") that complies with the requirements of this Section 2.5. Each Residual Element Condition Report shall provide a record of the asset condition of all Residual Elements, shall utilize the results of previous inspections and maintenance records, including all AMS records (supported by the Handback Inspections), and, for each Residual Element shall provide:

- 2.6.1 A description of the Residual Element;
- 2.6.2 Information that describes its current condition according to the accepted Handback Plan;

- 2.6.3 Photographs of the Residual Element to support the assessment of the asset condition; and
- 2.6.4 Written confirmation from the Independent Handback Consultant as to the findings of the Systems Integrator in the Residual Element Condition Report.

2.7 General Requirements for Handback Inspections

The Systems Integrator shall carry out each Handback Inspection:

- 2.7.1 In accordance with the Contract Standards and the accepted Handback Plan; and
- 2.7.2 In coordination with the MBTA and the Independent Handback Consultant.

2.8 First Handback Inspections

The Systems Integrator, the MBTA and the Independent Handback Consultant shall conduct an inspection and survey of the System (the “**First Handback Inspection**”) commencing 30 Months prior to the Expiration Date and ending 27 Months prior to the Expiration Date. The First Handback Inspection shall:

- 1.1.1 Assess the condition of all System Elements, including information required in respect of the Residual Element Condition Report;
- 1.1.2 Assess the extent to which the System is in compliance with the Contract Standards and capable of continued compliance with the Contract Standards, including consideration of:
 - 2.8.1.1 The level of Deductions incurred by the Systems Integrator over the Term and during the First Handback Inspection; and
 - 2.8.1.2 The Systems Integrator’s compliance with the Master Maintenance Plan and the extent to which the level of maintenance required for the System is consistent with Good Industry Practice; and
- 2.8.2 Determine the scope of the maintenance, repair, replacement and other Operating Services work necessary to ensure that all Handback Requirements will be satisfied as of the Expiration Date (the “**Handback Work**”).

2.9 Initial Handback Inspection Report

Following the First Handback Inspection, the Systems Integrator shall prepare and, no later than 26 Months prior to the Expiration Date, submit the initial Handback Inspection Report to the MBTA for its approval, acting reasonably. The initial Handback Inspection Report shall comply with the Contract Standards and include the following minimum information:

- 2.9.1 The results of the First Handback Inspection, including a detailed description of any deficiencies determined through the First Handback Inspection;
- 2.9.2 The Residual Element Condition Report;
- 2.9.3 The details of all Handback Work required and the timing and implementation strategy for the Handback Work;

- 2.9.4 An estimate of the Handback Reserve Amount; and
- 2.9.5 Written confirmation from the Independent Handback Consultant as to the findings and determinations of the Systems Integrator in the initial Handback Inspection Report.

The MBTA shall have not less than 30 days to review, comment and respond to the First Handback Inspection Report in accordance with Appendix 7 (MBTA Review Procedures). In reviewing and commenting on the initial Handback Inspection Report, the MBTA shall be allowed access to all of the Systems Integrator's records used in the preparation of the initial Handback Inspection Report.

2.10 Handback Work Obligations

Without limiting any other requirement hereunder, the Systems Integrator shall carry out the Handback Work in accordance with the Contract Standards and the approved initial Handback Inspection Report and each subsequent approved Handback Inspection Report. All Handback Work shall be completed prior to the Expiration Date.

2.11 Second Handback Inspections

The Systems Integrator, the MBTA and the Independent Handback Consultant shall conduct a second Handback Inspection commencing 17 Months prior to the Expiration Date and ending 15 Months prior to the Expiration Date. The objective of the second Handback Inspections shall be to:

- 2.11.1 Update the findings of the First Handback Inspection Report, including the Residual Element Condition Report; and
- 2.11.2 Record the actions that have been taken to address the findings of the First Handback Inspection, including all completed Handback Work; and
- 2.11.3 Determine whether changes in the Handback Work are necessary to achieve compliance with the Handback Requirements as of the Expiration Date.

2.12 Second Handback Inspection Report

Following the second Handback Inspection, the Systems Integrator shall prepare and, no later than 14 Months prior to the Expiration Date, submit the initial Handback Inspection Report to the MBTA for its approval, acting reasonably. The second Handback Inspection Report shall comply with the Contract Standards and include the following minimum information:

- 1.1.1 The results of the second Handback Inspection, including a detailed description of any deficiencies determined through the second Handback Inspection;
- 2.12.1 An updated Residual Element Condition Report;
- 2.12.2 A description of all Handback Work completed since the First Handback Inspection;
- 2.12.3 Any proposed changes to the Handback Work;
- 2.12.4 An updated estimate of the Handback Reserve Amount; and

- 2.12.5 Written confirmation from the Independent Handback Consultant as to the findings and determinations of the Systems Integrator in the second Handback Inspection Report.

The MBTA shall have not less than 30 days to review, comment and respond to the second Handback Inspection Report in accordance with Appendix 7 (MBTA Review Procedures). In reviewing and commenting on the second Handback Inspection Report, the MBTA shall be allowed access to all of the Systems Integrator's records used in the preparation of the second Handback Inspection Report.

2.13 Staff Training

No later than nine Months prior to the Expiration Date, the Systems Integrator shall make arrangements to provide training to the MBTA's nominated employees, or any other persons designated by the MBTA, pertaining to all of the aspects of the operation and maintenance of the System to facilitate a seamless handover of the System. The Systems Integrator shall provide for such training in accordance with the Contract Standards prior to the Expiration Date.

2.14 Final Handback Inspections and Report

Within 90 days prior to the Expiration Date, the Systems Integrator, the Independent Handback Consultant and the MBTA shall jointly carry out the final Handback Inspection. The Systems Integrator shall prepare and, no later than 30 days prior to the Expiration Date, submit the final Handback Inspection Report to the MBTA for its approval, acting reasonably. The final Handback Inspection Report shall comply with the Contract Standards and shall:

- 2.14.1 Include the final Residual Element Condition Report;
- 2.14.2 Demonstrate effective completion of all Handback Work identified in each prior Handback Inspection Report;
- 2.14.3 Demonstrate that the System is operating in compliance with the Contract Standards; and
- 2.14.4 Include written confirmation from the Independent Handback Consultant as to the findings and determination of the Systems Integrator in the final Handback Inspection Report.

2.15 Handback Certificate

On or before the Expiration Date, following the MBTA's review of the final Handback Inspection Report, the MBTA shall issue a certificate to the Systems Integrator (a "**Handback Certificate**") certifying either:

- 2.15.1 That all Handback Requirements have been met; or
- 2.15.2 That not all of the Handback Requirements have been met, specifying which Handback Requirements the MBTA considers have not been met.

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ATTACHMENT 9-A
PRICING FOR SUBCOMPONENTS OF CUSTOMER-FACING DEVICES

[Selected Proposer's Proposal Form 22.]

ATTACHMENT 9-B
UNIT RATES APPLICABLE TO WORK CLASSIFICATIONS

[Selected Proposer's Pro Forma Table 6B, without evaluation scenarios and as applicable to the Project Contractor for purposes of Section 2.1.5.4 of this Appendix 9.]

APPENDIX 11

UNIT RATES AND CHANGE IN COST METHODOLOGY

1. Purpose

Subject to the exceptions set forth in the definition of Change in Cost and the terms and conditions of Article 11 (Changes) and Article 13 (Supervening Events), as applicable, the methodology set forth in this Appendix shall be used for calculating Change in Cost. This Appendix also addresses pricing to be provided by the Project Contractor to Regional Transit Providers in accordance with Article 12 (Expansion to Regional Transit Providers).

2. Unit Rates

2.1 Applicability Generally

Where a Unit Rate is applicable in respect of any Change in Cost, the Change in Cost shall be determined by application of the Unit Rate to the quantity of items or hours, as applicable, involved in the determination of such Change in Cost, subject to the terms and conditions of this Appendix. The Unit Rates, where applicable, include full compensation to the Systems Integrator and any Project Contractor or Subcontractor in respect of the item or work involved, including all compensation for overhead, administration, benefits, Taxes, profit, risk or otherwise.

2.2 Applicability to Work Classifications

Unit Rates in respect of work classifications, as set forth in Attachment 11-A to this Appendix, shall:

- 2.2.1 Be applied to the appropriate work classification, as determined by reference to Good Industry Practice;
- 2.2.2 In respect of estimates prepared by the Systems Integrator for the MBTA, be applied to a reasonable estimate of the number of hours expected to be directly attributable to the MBTA Change or other applicable Compensation Event; and
- 2.2.3 In respect of a Change in Cost already incurred (subject to Section 8.1 of this Appendix), be applied to the number of hours actually and directly incurred due to the MBTA Change or other applicable Compensation Event; provided that, subject to Section 8.1 of this Appendix, such number of hours shall be reduced to the extent in excess of the number of hours reasonably necessary to respond to the MBTA Change or other applicable Compensation Event in accordance with Good Industry Practice.

Unit Rates in respect of work classifications shall not be applicable, and the Systems Integrator shall not be entitled to separately charge the MBTA for, any labor costs that are intended to be included in any permissible mark-up provided for under this Appendix.

2.3 Applicability to Devices, Readers and Retail Reload Locations

Unit Rates in respect of the unit cost of Devices, Readers and Retail Reload Locations shall be applied in accordance with the appropriate order size band set forth in Attachment 11-B to this Appendix based on the number of Devices, Readers or Retail Reload Locations (as applicable) involved in determining any applicable Change in Cost; provided that, such Unit Rates are based on the versions of the standards listed in Sections 1.1, 1.2, and 1.3 of Appendix 2.3 as of the date specified in Section 3.1-1 of Appendix 2.3. Any Change in Cost in respect of the Systems Integrator's obligation to install a Device, Reader or Retail Reload Location shall be determined based on the applicable unit installation cost set forth in Attachment 11-B to this Appendix 11; provided that, no such Change in Cost will be applicable under circumstances where an MBTA Person performs the applicable installation work. A Change in Cost in respect of the Operating Services for Devices, Readers and Retail Reload Locations installed pursuant to any Unplanned Expansion shall be determined based on the applicable "Expansion AP O&M per unit cost" set forth in Attachment 11-B of this Appendix and shall be payable beginning with the Month in which the applicable Device, Reader or Retail Reload Location is placed into Revenue Service, with the applicable "Expansion AP O&M per unit cost" subject to pro rata adjustment for such Month to reflect the number of days commencing with the date placed into Revenue Service and ending with the last day of such Month.

2.4 Fixed Change in Cost

If the MBTA implements an MBTA Change to amend Section 6.4-6 of Appendix 2.3 to remove the requirement that all Customer-Facing Devices shall provide change to the Users, the resulting Change in Cost shall be as specified in Attachment 11-C of this Appendix.

3. Materials

3.1 General

To the extent Unit Rates do not apply in respect of a Change in Cost relating to materials, material costs shall be the actual cost (supported by valid quotes and invoices from the supplier) of all materials to be used in the performance of the relevant work, including freight and delivery charges and a normal wastage allowance (as determined by reference to Good Industry Practice), subject to the terms and conditions of this Section 3.

3.2 Affiliated Source of Supply

If materials are obtained from a supply source owned in whole or in part by any Systems Integrator Person (or Affiliate thereof):

- 3.2.1 The cost of such materials shall not exceed the lowest of (a) the lowest price charged by such Systems Integrator Person (or Affiliate) for similar materials furnished to other projects, and (b) the lowest price charged by such Systems Integrator Person for similar materials otherwise furnished to the Project;
- 3.2.2 To the extent such materials were not specifically purchased for the relevant work, the Systems Integrator shall furnish an affidavit from itself, or from such other Systems Integrator Person (or Affiliate) that owns the supply or source of such materials, in either case, certifying that such materials were taken from the Systems Integrator's or such other Systems Integrator Person's (or Affiliate's) stock, that the quantity claimed was actually used, and that the price and transportation costs claimed represent actual costs to the Systems Integrator.

3.3 Commercially Reasonable Materials Costs

All materials costs payable pursuant to this Section shall be commercially reasonable. The Parties shall use reasonable efforts to agree on materials costs pursuant to this Section prior to the Systems Integrator incurring the applicable Change in Cost, and the Change in Cost associated with such materials shall be based on such agreed-upon costs. Absent any such agreement, if the MBTA, acting reasonably, determines that the cost of materials as otherwise determined pursuant to Section 3.1 of this Appendix is not commercially reasonable, the amount of the Change in Cost in respect of such materials shall be reduced to reflect a commercially reasonable cost; provided that, no such reduction shall be made if the Systems Integrator demonstrates to the reasonable satisfaction of the MBTA that it used competitive practices consistent with Section 5.2 of this Appendix in incurring such materials costs.

3.4 Permissible Mark-Up on Materials Costs

If a Change in Cost relating to materials is applicable pursuant to this Section, the total amount of such Change in Cost shall include a 15% mark-up on the total materials cost calculated pursuant to this Section. Such mark-up shall be deemed to include full and complete compensation for all overhead, administration, profit, risk or otherwise, including all labor costs associated with the procurement of the materials and all storage, insurance and other incidental costs.

4. Equipment

4.1 Applicability and Determination of Cost

To the extent Unit Rates do not apply in respect of the use of equipment owned or rented by the Systems Integrator or any Project Contractor or Subcontractor in connection with work directly necessitated by a Compensation Event, the Parties shall use reasonable efforts in accordance with Section 4.2 of this Appendix to agree on commercially reasonable rates for the use of such equipment prior to the Systems Integrator incurring the applicable Change in Cost, and the Change in Cost associated with such equipment shall be based on such agreed-upon rates. Absent any such agreement, the Change in Cost associated with such equipment shall be the actual cost charged for the use of such equipment; provided that:

- 4.1.1 Such actual cost is commercially reasonable; and
- 4.1.2 If the MBTA, acting reasonably, determines that the actual cost is not commercially reasonable or is otherwise excessive in relation to rates typically charged by contractors for similar equipment in the area where the work is to be performed, the amount of the Change in Cost in respect of such equipment shall be determined based on hourly rates consistent with rates typically charged by contractors for similar equipment in the area where the work is to be performed, as reasonably determined by the MBTA pursuant to Section 4.2 of this Appendix.

4.2 Commercially Reasonable Rates

In negotiating commercially reasonable rates pursuant to this Section or determining appropriate hourly rates pursuant to Section 4.1.2 of this Appendix, consideration shall be given to appropriate “blue book” hourly rates to the extent applicable to the equipment used or to be used, as determined by reference to Good Industry Practice and standard policies and procedures of the MBTA. All rates payable pursuant to this Section 4 shall be deemed in all cases to include compensation for the cost of fuel, oil, lubricants, supplies, necessary attachments, repairs and maintenance and incidentals of all kinds, as well as any costs incurred by the owner of the equipment in respect of depreciation, storage and insurance.

4.3 Computation of Time

Without limiting any requirement hereunder in respect of Change in Cost, the time to be paid for the use of equipment pursuant to this Section 4 shall be the actual time the equipment is in operation in connection with the relevant portion of the work being performed in respect of the calculation of Change in Cost and, subject to the approval of the MBTA (acting reasonably), may include idle time and the time required to move equipment to and from the Location to the extent of the actual cost incurred by the Systems Integrator in respect thereof as a direct result of the applicable Compensation Event. In computing the time for use of equipment, less than 30 minutes shall be considered one-half hour.

4.4 Permissible Mark-Up on Equipment Costs

If a Change in Cost relating to equipment is applicable pursuant to this Section, the total amount of such Change in Cost shall include a 10% mark-up on the total equipment cost calculated pursuant to this Section. Such mark-up shall be deemed to include full and complete compensation for all overhead, administration, profit, risk or otherwise, including all labor costs associated with the procurement of the equipment and all storage, insurance and other incidental costs. Incidental costs include the cost of individual pieces of equipment or tools used in connection with the equipment and having a replacement value of \$1,000 (Index Linked) or less, whether or not consumed by use.

5. Subcontracts

5.1 Applicability

If the Parties agree, or the Systems Integrator reasonably determines in accordance with Good Industry Practice, that a Subcontract is necessary to perform work directly necessitated by an MBTA Change or other applicable Compensation Event, the Change in Cost in respect of such Subcontracted work shall be determined in accordance with this Section. The provisions of this Section shall not be applicable to determine a Change in Cost in respect of Unplanned Expansions, which shall be determined solely in accordance with Section 2.3 of this Appendix.

5.2 Competitive Practices

For any Subcontract subject to this Section 5, the Systems Integrator shall utilize, or cause to be utilized, competitive practices to the maximum reasonable extent (including, where commercially reasonable and practicable, obtaining three competing quotes or estimates for costs expected to be in excess of \$50,000, Index Linked), and shall enter into, or cause to be entered into, the Subcontract on commercially reasonable terms and prices in light of the work to be performed. Subject to the foregoing and Section 5.3, the Change in Cost associated with any such Subcontract shall be the amount paid to the Subcontractor in accordance with the terms and conditions of the Subcontract for the performance of the Subcontracted work directly necessitated by the applicable Compensation Event.

5.3 Permissible Mark-ups

Mark-ups associated with Subcontracts subject to this Section 5 shall not exceed the amounts set forth in this Section 5.3 and, in all cases, shall be deemed to include full and complete compensation for all overhead, administration, profit, risk or otherwise, including all labor costs associated with procuring and administering the applicable Subcontract. The maximum mark-ups applicable in respect of such Subcontracts shall be as follows:

- 5.3.1 The maximum mark-up payable to the Subcontractor performing the Subcontracted work shall be 15% of the costs incurred by such Subcontractor in respect of labor, materials, equipment, supplies and any lower-tier Subcontract, in each case directly necessitated by the applicable Compensation Event;
- 5.3.2 Subject to Section 5.3.3, the maximum mark-up payable to the Project Contractor that enters in to such Subcontract shall be 10% of the amount paid to the Subcontractor for the Subcontracted work directly necessitated by the applicable Compensation Event; and
- 5.3.3 The maximum mark-up payable to the Systems Integrator shall be (a) if the Systems Integrator enters into the Subcontract directly (in which case Section 5.3.2 of this Appendix shall not apply) 10% of the amount paid to the Subcontractor, or (b) if Section 5.3.2 of this Appendix applies, 5% of the amount paid to the Subcontractor for the Subcontracted work directly necessitated by the applicable Compensation Event.

6. Governmental Approval Fees

To the extent an MBTA Change or other applicable Compensation Event requires the Systems Integrator to obtain additional Governmental Approvals or an amendment to an existing Governmental Approval or directly results in additional permitting fees under an existing Governmental Approval, the Change in Cost associated with such Compensation Event shall include all associated permitting fees.

7. Other Change in Cost

Any Change in Cost identified in the definition thereof that is not otherwise included in Sections 2 through 6 of this Appendix shall be the actual and documented cost reasonably incurred by the Systems Integrator as a direct result of the MBTA Change or other applicable Compensation Event.

8. Lump Sum Pricing and Cost Substantiation

8.1 Lump Sum Pricing

Without limiting any of the foregoing, the Parties shall use reasonable efforts to agree on the amount of any Change in Cost prior to the Systems Integrator incurring the Change in Cost. Where appropriate, the Parties, acting reasonably, may negotiate and agree to lump sum pricing associated with any Change in Cost, which lump sum pricing shall be consistent with the terms and conditions of this Appendix. To facilitate such negotiations, the Systems Integrator shall, without limiting any other obligation hereunder, furnish the MBTA with all information reasonably required by the MBTA regarding the expected Change in Cost. If the Parties agree upon a lump sum price in respect of a Change in Cost, the Parties shall execute a Change Order establishing the agreed-upon lump sum pricing, and:

- 8.1.1 The applicable Change in Cost shall be payable in accordance with the terms of such Change Order; and
- 8.1.2 The Systems Integrator's actual Change in Cost in respect of such Change Order shall not be subject to cost substantiation in accordance with Section 8.2 of this Appendix unless otherwise agreed to be the Parties in the applicable Change Order.

8.2 Cost Substantiation

Except as provided in Section 8.1 of this Appendix and without limiting any obligation under Section 5.6 of the Project Agreement, any request for payment by the Systems Integrator in respect of a Change in Cost shall be accompanied by a certificate of an authorized representative of the Systems Integrator, which certificate shall:

- 8.2.1 Certify that (a) the costs being invoiced are properly payable under this Project Agreement, specifying the provisions of this Project Agreement under which compensation is due, (b) such costs (exclusive of any permissible mark-up payable to the Systems Integrator) are equal to amounts paid by the Systems Integrator as a direct result of the applicable Compensation Event, and (c) all work performed for which cost reimbursement is being requested has been properly performed in accordance with the terms and conditions of this Project Agreement;
- 8.2.2 Be accompanied by copies of all documentation reasonably necessary to demonstrate that the invoiced costs (exclusive of any permissible mark-up payable to the Systems Integrator) have been paid and are reasonable; and
- 8.2.3 Be a condition precedent to the Systems Integrator's entitlement to payment for the applicable Change in Cost.

All documentation required under Section 8.2.2 shall be in a format and level of detail reasonably acceptable to the MBTA. To the extent reasonably necessary to confirm the payment of costs that are subject to cost substantiation under this Section 8.2, such documentation shall include copies of timesheets, invoices, canceled checks, expense reports, receipts and such other documents as may be reasonably requested by the MBTA.

9. Savings

When in connection with any Change documented in a Change Order or a Change Directive, the resulting Change in Cost results in a net aggregate saving to the Systems Integrator or a net aggregate reduction in the value of the work performed or of the System (or any individual element of the calculation of the Change in Cost, whatever the net aggregate result, involves such a saving or a reduction in value), the cost savings payable to the MBTA pursuant to Section 11.6 of the Project Agreement shall be calculated to take into account all of the Systems Integrator's (and, without double-counting, the Project Contractor and each relevant Subcontractor's) (a) otherwise increased profits and (b) avoided or avoidable overhead.

10. RTP Contract Pricing

10.1 Purpose

The purpose of this Section 10 is to set forth the contracting principles applicable to the negotiation of an RTP Contract between the Project Contractor and a Regional Transit Provider and certain pricing requirements applicable to any RTP Contract. Nothing in this Section 10 is intended to expand the Systems Integrator's obligations under Article 12 (Expansion to Regional Transit Providers) beyond the requirement to use of all reasonable efforts to cause the Project Contractor to comply with the requirements set forth in this Section 10 in negotiating and entering into any RTP Contract.

10.2 Anticipated Pricing Components

The anticipated pricing components of an RTP Contract are:

- 10.2.1 Compensation in respect of the “back office” licenses for use of the System by the Regional Transit Provider;
- 10.2.2 If the Regional Transit Provider requires modifications to the Technical Requirements (subject to Section 12.3(B) of the Project Agreement), compensation in respect of the labor required to plan and design the project for the Regional Transit Provider;
- 10.2.3 Compensation in respect of the furnishing of Devices and Readers to the Regional Transit Provider;
- 10.2.4 Compensation in respect of the labor, materials and equipment required to perform any installation work required by the Regional Transit Provider;
- 10.2.5 Compensation in respect of the labor required to implement baseline configuration for the Regional Transit Provider and perform any commissioning and testing, including pilot testing, prior to full service commencement for the Regional Transit Provider;
- 10.2.6 Compensation in respect of operations and maintenance services to be provided to the Regional Transit Provider; and
- 10.2.7 Compensation in respect of transaction fees for revenues managed and collected by the Project Contractor for the Regional Transit Provider.

The actual pricing components of an RTP Contract will be based on the scope of services required by the applicable Regional Transit Provider, and the pricing components identified in this Section may or may not be applicable to any particular RTP Contract.

10.3 Applicability of Unit Rates

Any compensation payable to the Project Contractor under an RTP Contract in respect of labor (by work classification), Devices and Readers shall not exceed the Unit Rates in respect thereof, as established by this Project Agreement and described in Section 3 of this Appendix. Any compensation described in Sections 10.2.2, 10.2.3 and 10.2.5 of this Appendix, and any applicable labor component of the compensation described in Sections 10.2.4 and 10.2.6, are subject to Unit Rates in accordance with this Section.

10.4 Transaction Fees

Any compensation described in Section 10.2.7 shall be payable on the same unit price basis as provided for hereunder in respect of the AP Transaction Rate and the unit price payable to the Project Contractor in respect of transactions under an RTP Contract shall not exceed the AP Transaction Rate (excluding the amount thereof attributable to Fare Cards) as long as this Project Agreement remains in effect; provided that such requirement:

- 10.4.1 Will not be applicable if this Project Agreement is no longer in effect; and

- 10.4.2 Is not applicable in respect of the provision of any fare cards by the Project Contractor to the Regional Transit Provider under the RTP Contract, which, if applicable, will be subject to negotiation between the Project Contractor and the Regional Transit Provider.

10.5 Good Faith Negotiations

The Systems Integrator shall use all reasonable efforts to cause the Project Contractor to enter into good faith negotiations with any Regional Transit Provider pursuant to Section 12.3(A) of the Project Agreement so as to result in pricing for the Regional Transit Provider under an RTP Contract that is:

- 10.5.1 Consistent with the terms and conditions of this Section 10; and
- 10.5.2 Commercially reasonable in light of the scope of services required by the Regional Transit Provider.

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**ATTACHMENT 11-A
UNIT RATES APPLICABLE TO WORK CLASSIFICATIONS**

[Selected Proposer's Pro Forma Table 6B, without the evaluation scenarios, to be set forth here. Hourly rates will be escalated annually by CPI.]

ATTACHMENT 11-B
UNIT RATES FOR DEVICES, READERS AND RETAIL RELOAD LOCATIONS

[Selected Proposer's Pro Forma Table 6A to be set forth here. The Unit Rates shall be inclusive of all procurement, component sourcing, manufacturing, certification, testing, and any freight costs, as well as: (a) all System Elements needed to deliver a fully-functional unit that complies with all the Technical Requirements for that particular unit (except those that apply in respect of its unique Location and installation characteristics); (b) the services, deliverables, and grants of rights that apply to that unit as set forth in Article 16; and (c) the initial Configuration and commissioning effort that is applicable to the unit (except such effort in respect of its particular Location and installation characteristics).]

**ATTACHMENT 11-C
FIXED CHANGE IN COST**

[Row 1 of Selected Proposer's Pro Forma Table 7 to be set forth here.]

APPENDIX 12 INSURANCE REQUIREMENTS

SECTION 1. INSURANCE REQUIREMENTS GENERALLY

1.1 Maintenance of Required Insurance

The Systems Integrator shall obtain and keep in force, or cause to be obtained and kept in force, the policies of insurance described below in accordance with the terms of this Appendix and Article 17 (Insurance, Damage and Destruction) of this Project Agreement. Each policy shall be obtained and be in force prior to the performance of any work or commencement of any activity intended to be insured by each policy.

1.2 Corporate Policies

The Systems Integrator may provide commercial general liability insurance, workers' compensation insurance, employer's liability insurance, automobile insurance, umbrella liability insurance, technology errors & omissions/professional liability insurance, and cyber liability insurance through the general corporate policies of the Systems Integrator, any Project Contractor or their respective Affiliates. In such case, the general corporate policies shall meet the applicable requirements of this Appendix.

1.3 Project-Specific Policies

Crime insurance/all risk money & securities insurance, installation floater insurance and property insurance shall be purchased specifically and exclusively for the Project, shall meet the applicable requirements of this Appendix and extend to all aspects of the Contract Services, with coverage limits devoted solely to the Project.

SECTION 2. REQUIRED INSURANCE

2.1 Required Insurance

The Systems Integrator shall obtain and keep in force, or cause to be obtained and kept in force, throughout the Term (and for any such longer period as expressly specified herein) the insurance coverages specified in this Section 2.

2.2 Commercial General Liability Insurance

Commercial general liability insurance covering all operations by or on behalf of the Systems Integrator on an occurrence basis against claims for bodily injury, property damage (including loss of use), personal injury and advertising injury with limits not less than \$1,000,000 per occurrence and \$2,000,000 annual aggregate. The commercial general liability policy must provide coverage for work performed under an insured contract within 50 feet of railroad tracks. This coverage must be evidenced with a certificate of insurance and a policy endorsement.

Terms and conditions for required commercial general liability insurance shall include:

- ISO Commercial General Liability Policy (Occurrence Form);
- Products and completed operations coverage maintained for at least two (2) years after the Termination Date;
- Blanket contractual liability;

- Broad form property damage; and
- The MBTA, and each other MBTA Entity and MBTA Person shall be an additional insured on a primary non-contributory basis.

2.3 **Automobile Liability Insurance**

Automobile liability insurance covering the use of all vehicles: owned, leased, hired and non-owned; with limits not less than \$1,000,000 combined single limit.

2.4 **Workers' Compensation Insurance and Employer's Liability Insurance**

Workers' compensation insurance, including employer's liability insurance as provided by Massachusetts General Laws, Chapter 152, as amended, covering all work and services performed under this Project Agreement. Such insurance shall contain a waiver of any and all subrogation rights against the MBTA (and any other MBTA Entity and MBTA Person). Workers' compensation coverage shall be provided in accordance with statutory limits. Employer's liability coverage shall be provided with the following minimum limits:

- \$1,000,000 each accident for bodily injury by accident;
- \$1,000,000 each employee for bodily injury by disease; and
- \$1,000,000 aggregate policy limit for bodily injury disease.

2.5 **Umbrella Liability Insurance**

Umbrella liability insurance with limits not less than \$10,000,000 per occurrence and annual aggregate, covering all work and services performed under this Project Agreement. Such insurance shall be written on an occurrence basis and follow the form of underlying insurance terms and conditions.

2.6 **Technology Errors & Omissions/Professional Liability Insurance**

Technology errors & omissions/professional liability insurance, in an amount not less than \$25,000,000 per claim and annual aggregate (except as otherwise provide in this Section 2.6 in the event a Project-specific policy is obtained and maintained by the Systems Integrator), covering (a) all acts, errors, omissions, negligence, infringement of Intellectual Property (except patent and trade secrets); (b) network security and privacy risks, including unauthorized access, failure of security, breach of privacy perils, wrongful disclosure, collection, or other negligence in the handling of confidential information, privacy perils, and including coverage for related regulatory defense and penalties; and (c) data breach expenses, in an amount not less than \$10,000,000, including consumer notification, whether or not required by Applicable Law, computer forensic investigations, public relations and crisis management firm fees, credit file or identity monitoring or remediation services in the performance of services for the MBTA or on behalf of the MBTA hereunder. If a sub-limit applies to any elements of coverage, the certificate of insurance evidencing the coverage above must specify the coverage section and the amount of the sub-limit. Such insurance shall be maintained in force at all times during the Term and for a period of four (4) years following the Termination Date, for services completed during the Term.

The minimum per claim and annual aggregate amounts of coverage required by this Section 2.6 may be reduced to \$10,000,000 in the event the Systems Integrator obtains and maintains the insurance coverage required by this Section 2.6 through a Project-specific policy meeting the requirements of Section 1.3 of this Appendix 12, instead of through a general corporate policy as permitted pursuant to Section 1.2 of this Appendix 12.

2.7 Cyber Liability

Network security and privacy liability insurance, including unauthorized access, failure of security, breach of privacy perils, wrongful disclosure, collection, or other negligence in the handling of confidential information, privacy perils, and including coverage for related regulatory defense and penalties in an amount not less than \$10,000,000. The policy shall contain data breach expenses, in an amount not less than \$10,000,000 and payable whether incurred by the MBTA or the Systems Integrator, including consumer notification, whether or not required by Applicable Law, computer forensic investigations, public relations and crisis management firm fees, credit file or identity monitoring or remediation services.

2.8 Crime Insurance or All Risk Money & Securities Insurance

Comprehensive crime/all risk money & securities insurance, with minimum limits of \$10,000,000 per occurrence/aggregate, providing coverage for any loss of money, securities or property in the Systems Integrator's care, custody or control. Such insurance shall include employee theft, embezzlement, inside/outside premises, in-transit for theft, robbery or burglary of money, securities or property.

2.9 Installation Floater Insurance

Property insurance written on an installation floater "all risk" or equivalent property form in the amount of \$10,000,000, including the cost of materials supplied or installed by others, on a replacement cost basis. Installation floater or equivalent property insurance shall include insurance for the perils of fire (with extended coverage) and physical loss or damage including terrorism, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, testing, start up, mechanical and electrical breakdown and resultant damage from faulty workmanship and debris removal as a result of such insured loss. The installation floater insurance shall cover property stored off site and in transit. The Systems Integrator shall purchase and maintain insurance that will insure the MBTA against loss of use, business interruption and extra expense due to a fire or other insured perils however caused. Such insurance shall remain in force until the Full Service Commencement Date.

2.10 Property Insurance

Property insurance written on a property "all risk" form in the amount of \$10,000,000, including the cost of materials supplied or installed by others, on a replacement cost basis. The Systems Integrator will provide property insurance for all property that is not covered by a separate installation floater policy until the Full Service Commencement Date.

2.11 General Conditions Applicable to the Required Insurance

General conditions applicable to the policies of Required Insurance are specified in this Section 2.11.

2.11.1 The Required Insurance shall be placed with insurance companies licensed and/or authorized by the Massachusetts Division of Insurance to do business in the Commonwealth and that have a minimum rating of A- in the latest available Best's Rating Guide, unless otherwise approved by the MBTA, in its discretion.

2.11.2 The Required Insurance shall be obtained and be in force prior to the performance of any work or the commencement of any activity intended to be insured by each policy and in no event later than the Financial Close Date; provided that, on the Effective Date (if earlier than the Financial Close Date), the Systems Integrator shall ensure that all

insurance required under the Early Works Agreement remains in full force and effect for all Implementation Work performed prior to the Financial Close Date and shall provide the MBTA with all information required under Section 2.11.7 in respect of such insurance. The Required Insurance shall be kept in full force and effect throughout the Term (and for any such longer period as expressly specified herein), shall be primary to and non-contributory to any insurance or self-insurance maintained by the MBTA (and any other MBTA Entity and MBTA Person), and shall require that the MBTA be given at least 30 days advance written notice in the event of any cancellation or expiration.

- 2.11.3 The MBTA, and each other MBTA Entity and MBTA Person shall be named as an additional insured under the commercial general liability insurance, automobile liability insurance and umbrella liability insurance policies.
- 2.11.4 The workers' compensation and employer's liability insurance policies shall include a waiver of subrogation in favor of the MBTA which precludes these insurers from being able to make any subrogation claims against the MBTA (and any other MBTA Entity and MBTA Person).
- 2.11.5 Required Insurance shall be provided by or on behalf of Project Contractors and Subcontractors to cover the operations such Project Contractors and Subcontractors perform.
- 2.11.6 The Required Insurance shall not contain any exclusions for acts of terrorism, and shall fully cover any acts of terrorism, irrespective of whether such acts of terrorism are caused by domestic or foreign terrorists, and irrespective of whether such acts of terrorism are certified or non-certified by the Secretary of the Treasury, in concurrence with the Secretary of State and the Attorney General of the United States, to be an act of terrorism pursuant to the federal Terrorism Risk Insurance Act of 2001.
- 2.11.7 On or prior to the Financial Close Date (subject to Section 2.11.2) and throughout the Term (and for any such longer period as expressly specified herein) upon the issuance of a policy of insurance and annually thereafter, and at any other time upon the written request of the MBTA, the Systems Integrator shall deliver to the MBTA a copy of policy endorsements and certificates for all Required Insurance hereunder evidencing that Required Insurance policies, including required limits and sub-limits, are in place and provide coverage as required.
- 2.11.8 If any of the Required Insurance contains a deductible or self-insured retention, the Systems Integrator shall be responsible for such deductible or self-insured retention. The MBTA shall have the right to approve, in its discretion, any deductible or self-insured retention over \$500,000.
- 2.11.9 If requested in writing by the MBTA, the Systems Integrator shall furnish copies of the declaration page of the Required Insurance policies.

SECTION 3. LENDER INSURANCE

3.1 Lender Insurance Requirements; Additional Insurance Policies

If under the terms of any Funding Agreement or Security Document the Systems Integrator is obligated to, and does, carry insurance coverage with higher limits, lower deductibles or self-insured retentions, or

broader coverage than required under this Project Agreement, the Systems Integrator's provision of such insurance shall satisfy the applicable requirements of this Project Agreement; provided such insurance policy meets all the other applicable requirements of this Appendix.

If the Systems Integrator carries insurance coverage in addition to that required under this Project Agreement, then the Systems Integrator shall include each MBTA Entity and each MBTA Person as additional insureds thereunder, if available and as required herein, as and to the extent they have an insurable interest. If, however, the Systems Integrator demonstrates to the MBTA that inclusion of such persons as additional insureds will increase the premium, the MBTA shall elect either to pay the increase in premium or forego additional insured coverage.

SECTION 4. SPARE PARTS STORED AT MBTA FACILITIES

The Systems Integrator shall obtain and maintain appropriate insurance for any spare parts or equipment stored at any MBTA facility pursuant to Appendix 4.6 in light of the Systems Integrator's risk of loss in respect of such spare parts or equipment.

OPTION A

BID FINANCIAL MODEL COMPENSATION TERMINATION OPTION

**APPENDIX 13
TERMINATION COMPENSATION**

**SECTION 1. COMPENSATION ON TERMINATION FOR CONVENIENCE,
TERMINATION FOR MBTA EVENT OF DEFAULT AND
TERMINATION BY COURT RULING**

The Termination Amount payable by the MBTA to the Systems Integrator in connection with any Termination for Convenience pursuant to Section 24.2, any termination for MBTA Default pursuant to Section 24.4, or Termination by Court Ruling pursuant Section 24.5 of the Project Agreement shall equal the amount calculated at the Termination Date as follows:

- (a) the greater of: i) \$0; or ii) all amounts shown in the Financial Model as payable by the Systems Integrator as distributions from the Termination Date to the end of the Initial Term or, if the Termination Date occurs during a Renewal Term, the applicable Renewal Term, either in dividends or other distributions on the share capital of the Systems Integrator or as payments of interest or repayments of principal made by the Systems Integrator under any Equity Member Funding Agreement. All amounts shall be discounted at the Base Case Equity IRR from the date on which it is shown to be payable in the Financial Model to the Termination Date, *minus* Deferred Equity Amounts as at the Termination Date; *plus*
- (b) Net Lenders' Liabilities; *plus*
- (c) Subcontractor Breakage Costs; *plus*
- (d) the greater of: i) \$0; or ii) the Handback Reserve Account balance *minus* an amount equal to the cost of the work necessary to provide for compliance with the Handback Requirements; *plus*
- (e) Systems Integrator Employee Redundancy Payments; *minus*
- (f) any Termination Deduction Amount and any other amounts due and owing to the MBTA pursuant to this Project Agreement, including any outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

**SECTION 2. COMPENSATION ON TERMINATION FOR EXTENDED EVENTS
AND TERMINATION FOR UNINSURABLE RISK**

The Termination Amount payable by the MBTA to the Systems Integrator in connection with any Termination for Extended Events pursuant to Section 24.6 of the Project Agreement or Termination for Uninsurable Risk pursuant Section 24.7 of the Project Agreement shall equal the amount calculated at the Termination Date as follows:

- (a) The greater of: i) \$0; or ii) All amounts paid to the Systems Integrator prior to the Termination Date in the form of direct investments by Equity Members in the Systems Integrator, minus dividends and other distributions paid to the Equity Members (save to the extent deducted below); *plus*
- (b) The principal amount of any Equity Member Debt outstanding as of the Termination Date, minus an amount equal to all distributions made by the Systems Integrator under any Equity Member Funding Agreement prior to the Termination Date; *plus*
- (c) Net Lenders' Liabilities; *plus*
- (d) Subcontractor Breakage Costs; *plus*
- (e) the greater of: i) \$0; or ii) the Handback Reserve Account balance minus an amount equal to the cost of the work necessary to provide for compliance with the Handback Requirements; *plus*
- (f) Systems Integrator Employee Redundancy Payments; *minus*
- (g) any Termination Deduction Amount and any other amounts due and owing to the MBTA pursuant to this Project Agreement, including any outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

SECTION 3. COMPENSATION ON TERMINATION FOR SYSTEMS INTEGRATOR EVENT OF DEFAULT

3.1. On or prior the Full Service Commencement Date

The Termination Amount payable by the MBTA to the Systems Integrator in connection with any termination for a Systems Integrator Event of Default pursuant Section 24.3 of the Project Agreement on or prior to the Full Service Commencement Date shall equal the amount calculated at the Termination Date as follows:

3.1.1 the lower of:

- (a) the Implementation Work Value; *or*
- (b) Net Lenders' Liabilities;

Less:

- (c) any Termination Deduction Amount and any other amounts due and owing to the MBTA pursuant to this Project Agreement, including any outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

3.2. After the Full Service Commencement Date

The Termination Amount payable by the MBTA to the Systems Integrator in connection with any termination for Systems Integrator Event of Default pursuant Section 24.3 of the Project Agreement after the Full Service Commencement Date shall equal the amount calculated at the Termination Date as follows:

- 3.2.1 80% of Net Lenders' Liabilities; *minus*
- 3.2.2 Maintenance Rectification Costs; *minus*
- 3.2.3 any Termination Deduction Amount and any other amounts due and owing to the MBTA pursuant to this Project Agreement, including any outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

SECTION 4. COMPENSATION ON TERMINATION PRIOR TO FINANCIAL CLOSE

The Systems Integrator shall be entitled to receive the Financial Close Termination Sum if the MBTA terminates this Project Agreement pursuant to Appendix 14, but only in the circumstances where the MBTA has no right to draw and retain the full amount of the Financial Close Security. The MBTA shall pay such amount to the Systems Integrator on or before the date which is sixty (60) days after the date on which the Systems Integrator shall have elected to terminate this Project Agreement.

SECTION 5. MISCELLANEOUS COMPENSATION PROVISIONS

5.1. Termination Amount

When calculating any Termination Amount pursuant Section 1 or 2 of this Appendix 13, the Termination Amount payable to the Systems Integrator shall not be lower than: (a) the amount equal to Lenders' Liabilities, less (b) outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

If any Termination Amount by the MBTA to the Systems Integrator pursuant to Section 1 or 2 of this Appendix 13 is paid after the Termination Date, the Termination Amount shall be adjusted to include:

- 5.1.1 from the Termination Date to the date that such Termination Amount is paid by the MBTA to the Systems Integrator, interest accrued (on a daily basis) on the outstanding principal due to the Lenders, and at the rate due (excluding default interest), under the Finance Documents as of the Termination Date.
- 5.1.2 from the Termination Date to the date that such Termination Amount is paid by the MBTA to the Systems Integrator any net payments or net receipts under any Hedging Arrangements that was in effect on the Termination Date but not terminated until such date of payment.

5.2. Timing of Termination Amount

Any Termination Amount shall be payable by the MBTA sixty (60) days after the later of: (a) the Systems Integrator's satisfaction of its obligations under Section 24.9 and 24.10 of the Project Agreement; or (b) the Termination Date.

5.3. Negative Termination Amount

To the extent that any Termination Amount calculated pursuant to Section 3 of this Appendix 13 is calculated to be less than zero dollars (\$0), then such Termination Amount shall be the lower of: (a) outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2; and (b) zero dollars (\$0). Any negative Termination Amount due to the MBTA shall be payable to the MBTA 24 hours and 4 Business Days following the Termination Date.

5.4. Lenders' Liabilities

The MBTA shall be entitled to rely on a certificate of the Collateral Agent as conclusive as to the amount of the Lenders' Liabilities outstanding at the relevant time.

5.5. Gross up of Termination Amount

If any Termination Amount payable by the MBTA to the Systems Integrator pursuant to Section 1 or 2 of this Appendix 13 is subject to any Tax under Applicable Law, then the MBTA shall pay the Systems Integrator such additional amount as the MBTA reasonably determines will put the Systems Integrator in the same after-tax position as it would have been in had the payment not been subject to such Tax, taking into account of any relief, allowances, deductions or credits in respect of any such Tax (whether by choice or not) which may be available to the Systems Integrator to reduce the such Tax to which the payment is subject.

*OPTION B***FAIR MARKET VALUE TERMINATION COMPENSATION OPTION****APPENDIX 13
TERMINATION COMPENSATION****SECTION 1. COMPENSATION ON TERMINATION FOR CONVENIENCE,
TERMINATION FOR MBTA EVENT OF DEFAULT AND
TERMINATION BY COURT RULING****1.1. Calculation of the Termination Amount**

The Termination Amount payable by the MBTA to the Systems Integrator in connection with any Termination for Convenience pursuant to Section 24.2, any termination for MBTA Default pursuant to Section 24.4, or Termination by Court Ruling pursuant Section 24.5 of the Project Agreement shall equal the amount calculated at the Termination Date as follows:

- (a) the MBTA Termination Amount; *plus*
- (b) Net Lenders' Liabilities; *plus*
- (c) Subcontractor Breakage Costs; *plus*
- (d) the greater of: i) \$0; or ii) the Handback Reserve Account balance *minus* an amount equal to the cost of the work necessary to provide for compliance with the Handback Requirements; *plus*
- (e) Systems Integrator Employee Redundancy Payments; *minus*
- (f) any Termination Deduction Amount and any other amounts due and owing to the MBTA pursuant to this Project Agreement, including any outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

1.2. Calculation of the MBTA Termination Amount

- 1.2.1 The MBTA Termination Amount shall be calculated as the net present value of the anticipated future nominal Distributions payable by the Systems Integrator from the Termination Date to the end of the Initial Term or, if the Termination Date occurs during a Renewal Term, the applicable Renewal Term, either in dividends or other distributions on the drawn share capital of the Systems Integrator or as payments of interest or repayments of principal (including, for clarity, capitalized interest) made by the Systems Integrator under any Equity Member Funding Agreement (post-tax on the part of the Systems Integrator but pre-tax on the part of the Equity Members) based on an appraisal by an independent third party expert appraiser that is nationally recognized for the conduct of valuation exercises.

- 1.2.2 The appraisal shall be provided within 90 days of the appointment by both Parties of such independent appraiser (provided that if the Parties fail to agree on the identity of such independent appraiser and fail to complete such appointment by the 15th Business Day following the Termination Date, then the MBTA shall provide to the Systems Integrator within 15 Business Days the names of three nationally recognized independent appraisers. Within 15 Business Days of receipt of the names of the nationally recognized independent appraisers, the Systems Integrator shall select one of the three MBTA identified appraisers to be jointly appointed.).
- 1.2.3 For purposes of the calculation of such net present value, the Parties shall instruct the independent appraiser to:
- (a) utilize a discount rate that is based on both (i) projects in the United States of America employing a similar risk profile and a similar payment mechanism and (ii) the assumption that no event has occurred for which Termination Amount is payable and the equity interests of the Equity Members of the Systems Integrator are freely transferable and are being sold in the open market; and
 - (b) estimate the anticipated future nominal Distributions based on the performance of the project up to the Termination Date employing an approach that considers the most recent Financial Model update and making any adjustments for positive or negative operating performance that is not yet reflected in the Financial Model update.

The determination of the independent appraiser shall, except in the case of manifest error or fraud, be final unless either Party challenges such determination within 30 days. If such a challenge is filed, the amount shall be determined in accordance with the Dispute Resolution Procedures.

SECTION 2. COMPENSATION ON TERMINATION FOR EXTENDED EVENTS AND TERMINATION FOR UNINSURABLE RISK

The Termination Amount payable by the MBTA to the Systems Integrator in connection with any Termination for Extended Events pursuant to Section 24.6 of the Project Agreement or Termination for Uninsurable Risk pursuant Section 24.7 of the Project Agreement shall equal the amount calculated at the Termination Date as follows:

- (a) The greater of: i) \$0; or ii) All amounts paid to the Systems Integrator prior to the Termination Date in the form of direct investments by Equity Members in the Systems Integrator, minus dividends and other distributions paid to the Equity Members (save to the extent deducted below); *plus*
- (b) The principal amount of any Equity Member Debt outstanding as of the Termination Date, minus an amount equal to all distributions made by the

Systems Integrator under any Equity Member Funding Agreement prior to the Termination Date; *plus*

- (c) Net Lenders' Liabilities; *plus*
- (d) Subcontractor Breakage Costs; *plus*
- (e) the greater of: i) \$0; or ii) the Handback Reserve Account balance minus an amount equal to the cost of the work necessary to provide for compliance with the Handback Requirements; *plus*
- (f) Systems Integrator Employee Redundancy Payments; *minus*
- (g) any Termination Deduction Amount and any other amounts due and owing to the MBTA pursuant to this Project Agreement, including any outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

SECTION 3. COMPENSATION ON TERMINATION FOR SYSTEMS INTEGRATOR EVENT OF DEFAULT

3.1. On or prior the Full Service Commencement Date

The Termination Amount payable by the MBTA to the Systems Integrator in connection with any termination for a Systems Integrator Event of Default pursuant Section 24.3 of the Project Agreement on or prior to the Full Service Commencement Date shall equal the amount calculated at the Termination Date as follows:

3.1.1 the lower of:

- (a) the Implementation Work Value; *or*
- (b) Net Lenders' Liabilities;

Less:

- (c) any Termination Deduction Amount and any other amounts due and owing to the MBTA pursuant to this Project Agreement, including any outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

3.2. After the Full Service Commencement Date

The Termination Amount payable by the MBTA to the Systems Integrator in connection with any termination for Systems Integrator Event of Default pursuant Section 24.3 of the Project Agreement after the Full Service Commencement Date shall equal the amount calculated at the Termination Date as follows:

3.2.1 80% of Net Lenders' Liabilities; *minus*

3.2.2 Maintenance Rectification Costs; *minus*

3.2.3 any Termination Deduction Amount and any other amounts due and owing to the MBTA pursuant to this Project Agreement, including any outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

SECTION 4. COMPENSATION ON TERMINATION PRIOR TO FINANCIAL CLOSE

The Systems Integrator shall be entitled to receive the Financial Close Termination Sum if the MBTA terminates this Project Agreement pursuant to Appendix 14, but only in the circumstances where the MBTA has no right to draw and retain the full amount of the Financial Close Security. The MBTA shall pay such amount to the Systems Integrator on or before the date which is sixty (60) days after the date on which the Systems Integrator shall have elected to terminate this Project Agreement.

SECTION 5. MISCELLANEOUS COMPENSATION PROVISIONS

5.1. Termination Amount

When calculating any Termination Amount pursuant Section 1 or 2 of this Appendix 13, the Termination Amount payable to the Systems Integrator shall not be lower than: (a) the amount equal to Lenders' Liabilities, less (b) outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2.

If any Termination Amount by the MBTA to the Systems Integrator pursuant to Section 1 or 2 of this Appendix 13 is paid after the Termination Date, the Termination Amount shall be adjusted to include:

5.1.1 from the Termination Date to the date that such Termination Amount is paid by the MBTA to the Systems Integrator, interest accrued (on a daily basis) on the outstanding principal due to the Lenders, and at the rate due (excluding default interest), under the Finance Documents as of the Termination Date.

5.1.2 from the Termination Date to the date that such Termination Amount is paid by the MBTA to the Systems Integrator any net payments or net receipts under any Hedging Arrangements that was in effect on the Termination Date but not terminated until such date of payment

5.2. Timing of Termination Amount

Any Termination Amount shall be payable by the MBTA sixty (60) days after the later of: (a) the Systems Integrator's satisfaction of its obligations under Section 24.9 and 24.10 of the Project Agreement; or (b) the Termination Date.

5.3. Negative Termination Amount

To the extent that any Termination Amount calculated pursuant to Section 3 of this Appendix 13 is calculated to be less than zero dollars (\$0), then such Termination Amount shall be the lower of: (a) outstanding Fare Revenue required to be deposited pursuant to Appendix 4.2; and (b) zero dollars (\$0). Any negative Termination Amount due to the MBTA shall be payable to the MBTA 24 hours and 4 Business Days following the Termination Date.

5.4. Lenders' Liabilities

The MBTA shall be entitled to rely on a certificate of the Collateral Agent as conclusive as to the amount of the Lenders' Liabilities outstanding at the relevant time.

5.5. Gross up of Termination Amount

If any Termination Amount payable by the MBTA to the Systems Integrator pursuant to Section 1 or 2 of this Appendix 13 is subject to any Tax under Applicable Law, then the MBTA shall pay the Systems Integrator such additional amount as the MBTA reasonably determines will put the Systems Integrator in the same after-tax position as it would have been in had the payment not been subject to such Tax, taking into account of any relief, allowances, deductions or credits in respect of any such Tax (whether by choice or not) which may be available to the Systems Integrator to reduce the such Tax to which the payment is subject.

Definitions to Appendix 1:

"MBTA Termination Amount" means the amount calculated in accordance with Section 1.2 of Appendix 13

APPENDIX 14

FINANCIAL CLOSE PROCEDURES AND CONDITIONS

1. Financial Close

1.1. Financial Close Conditions

Financial Close will occur upon:

- 1.1.1 Satisfaction (or waiver by the MBTA) of each of the Systems Integrator Conditions Precedent; and
- 1.1.2 Satisfaction (or waiver by the Systems Integrator) of each of the MBTA Conditions Precedent.

1.2. Closing Checklist and Timeline

Without limiting or otherwise modifying either Party's obligations under this Project Agreement in respect of Financial Close:

- 1.2.1 No later than five Business Days following the Effective Date, the Systems Integrator shall submit to the MBTA for its acceptance, acting reasonably, a closing checklist and timeline identifying all documents, submissions and other actions (including actions of the Parties and any required action of a third party) then reasonably anticipated by the Systems Integrator to be necessary to achieve Financial Close by the Financial Close Deadline; and
- 1.2.2 The Parties shall use all reasonable efforts to deliver, respond to and comment on documents, including draft documents, necessary to satisfy the Financial Close Conditions in conformity with the closing checklist and timeline, as accepted by the MBTA in accordance with Section 1.2.1 above.

1.3. Certifications

Any matter that must be "certified" by a Party under this Appendix 14 shall be certified in writing by an authorized representative of such Party and any such written certification shall be in form and substance reasonably acceptable to the Party receiving such certification.

2. Conditions Precedent to Financial Close

2.1. Systems Integrator Conditions Precedent

The Systems Integrator shall be responsible for satisfying the following conditions precedent to Financial Close (each a "**Systems Integrator Condition Precedent**"):

- 2.1.1 The Financing Documents (to the extent not addressed in Section 2.1.2 of this Appendix 14), the Equity Member Funding Agreement, the Project Contracts and any amendments or supplements thereto, shall be in form and substance reasonably

acceptable to the MBTA (such approval only to be capable of being withheld by the MBTA if the relevant document fails to comply with the terms of this Project Agreement, to the extent applicable, or is otherwise materially inconsistent with the relevant term sheet provided in the Proposal; provided that such inconsistency is not due to the MBTA's election pursuant to Section 3.2 of this Appendix 14 or the Systems Integrator's election pursuant to Section 4.1 of this Appendix 14), and the Systems Integrator shall have provided fully executed versions of each such document to the MBTA that are certified by the Systems Integrator as being true, complete and accurate copies of the originals;

- 2.1.2 The Systems Integrator shall have provided the MBTA with a counterpart of the Lenders' Remedies Agreement and the Material Contract Direct Agreement(s), in each case, (a) executed by an authorized officer of each party thereto other than the MBTA and (b) in the form set forth in the Transaction Forms. ;
- 2.1.3 All conditions precedent to closing and funding the Project Debt under the Financing Documents shall have been met (or otherwise waived) and the Systems Integrator shall have provided the MBTA with a certificate evidencing the same;
- 2.1.4 Not less than five Business Days prior to the anticipated Benchmark Interest Rate Adjustment Date and the anticipated Financial Close Date, the Systems Integrator shall have delivered to the MBTA: (a) an updated unrestricted electronic version of the Preliminary Financial Model, which version incorporates any amendments made between the Effective Date and such day; (b) the books and documents setting forth all assumptions, calculations and methodology used in the preparation of the Financial Model and any other documentation necessary or reasonably requested by the MBTA to operate the Financial Model; and (c) an update to the audit report previously submitted by the Systems Integrator in its Proposal, which update shall be in compliance with Section 14.6(F) of the Project Agreement;
- 2.1.5 All representations and warranties of the Systems Integrator under this Project Agreement shall be true and correct in all material respects when made and at the Financial Close Date, and the Systems Integrator shall have delivered to the MBTA a certificate certifying to the same;
- 2.1.6 On and from the Effective Date through and including the Financial Close Date, the Systems Integrator shall have performed and complied with its material obligations under this Project Agreement that are required to be performed or complied with as of the Financial Close Date, and no Systems Integrator Event of Default (or event that, with the passage of time or the giving of any notice, would become a Systems Integrator Event of Default) shall have occurred and be continuing on the Financial Close Date;
- 2.1.7 The Systems Integrator shall have provided the MBTA with an insurance binder or copies of certificates of insurance for all Required Insurance required to be in place on or before Financial Close and a certificate certifying compliance with the Insurance Requirements as of Financial Close;
- 2.1.8 The Systems Integrator shall have provided the MBTA with such documents and certificates as the MBTA may reasonably request evidencing the organization, existence and good standing of the Systems Integrator, the authorization of the entry by the

Systems Integrator into this Project Agreement and the Project Contracts to which it is a party, all in form and substance reasonably satisfactory to the MBTA;

- 2.1.9 The Systems Integrator shall have provided the MBTA with one or more legal opinion(s) of the Systems Integrator's counsel (in-house or external) substantially in the form attached hereto as Transaction Form I (Systems Integrator Counsel Legal Opinion);
- 2.1.10 The Systems Integrator shall have provided the MBTA with each Submittal required under the Technical Requirements to be provided to the MBTA on or prior to the Financial Close Date; and
- 2.1.11 The Systems Integrator shall have deposited into escrow all necessary documents which support the pricing of Allowable AP Transaction Fees subject to adjustment in accordance with Appendix 8 to this Project Agreement, which documents may include Systems Integrator developed assumptions, third party contract or other documents, as necessary.

2.2. MBTA Conditions Precedent

The MBTA shall be responsible for satisfying the following conditions precedent to Financial Close (each an "**MBTA Condition Precedent**"):

- 2.2.1 All representations and warranties of the MBTA under this Project Agreement shall be true and correct in all material respects when made and at the Financial Close Date, the MBTA shall have performed and complied with all material covenants and obligations of the MBTA under this Project Agreement to have been performed or complied with as of the Financial Close Date, and the MBTA shall have delivered to the Systems Integrator a certificate certifying to the same;
- 2.2.2 The MBTA shall have provided the Systems Integrator and the Lenders with a legal opinion of the MBTA's counsel in the form attached hereto as Transaction Form J (MBTA Counsel Legal Opinion);
- 2.2.3 Subject to Section 2.1.2, the MBTA shall have executed and delivered to the Systems Integrator and each other party thereto the Lenders' Remedies Agreement and the Material Contract Direct Agreement(s);
- 2.2.4 The MBTA shall have cooperated with the Systems Integrator in providing disclosure information to the Systems Integrator about the MBTA and the Commonwealth and shall have provided to the Systems Integrator customary certifications and opinions, including appropriate opinions in connection with the issuance of any Bonds, and executed an agreement with respect to any continuing disclosure requirements that apply to the underwriter of any Project Debt in accordance with any Applicable Law; and
- 2.2.5 Subject to the Systems Integrator satisfying its obligations with respect to the submission of the Cost-Certain Specifications pursuant to Appendix 2.13 and Appendix 7, the MBTA shall have accepted the Cost-Certain Specifications proposed by the Systems Integrator in accordance with Appendix 2.13 and Appendix 7.

3. Key Financial Events

3.1. Rights with respect to Key Financial Events

To the extent that fluctuations in the Benchmark Interest Rates(s) during the Benchmark Interest Rate Protection Period would result in an upward adjustment to the APC pursuant to Section 10 of this Appendix 14 of more than ten percent (10%), or, in the reasonable opinion of the MBTA, are likely to result in an upward adjustment to the APC of more than ten percent (10%) (each, a “**Key Financial Event**”), then the MBTA may, in its discretion, by written notice to the Systems Integrator:

- 3.1.1 Terminate this Project Agreement pursuant to Section 4.1 of this Appendix 14; or
- 3.1.2 Take any action pursuant to Section 3.2 of this Appendix 14.

3.2. Mitigation of Key Financial Events Prior to Financial Close

If a Key Financial Event has occurred and the MBTA elects to take action pursuant to Section 3.1.2, the MBTA may, in consultation with the Systems Integrator, attempt to mitigate the impact of the event by:

- 3.2.1 Increasing the APC up to and in excess of ten percent (10%);
- 3.2.2 Requiring the Systems Integrator to introduce alternative sources of debt and/or debt structures into its Financial Plan, in which case, the MBTA may require the Systems Integrator to use reasonable efforts to conduct a timely, transparent financing competition to identify and arrange for the lowest-priced debt financing commercially available on terms reasonably satisfactory to the Systems Integrator; provided, that the Systems Integrator shall be entitled to recoup from the MBTA the reasonably incurred costs associated with such a funding competition; and/or
- 3.2.3 Taking any other action(s) mutually agreed by the MBTA and the Systems Integrator, including those which may be proposed by the Systems Integrator to mitigate any material adverse change in the Systems Integrator’s overall risk profile with respect to the Project.

4. Termination Prior to Financial Close Deadline

4.1. MBTA Termination Prior to Financial Close Deadline – Key Financial Events

To the extent that the MBTA makes an election pursuant to Section 3.1.1 of this Appendix 14, then this Project Agreement shall terminate in its entirety upon 15 days' written notice to the Systems Integrator and, in such event, the MBTA shall have no right to draw on the Financial Close Security and shall promptly return the Financial Close Security; provided, that the MBTA will suspend its notice of termination, if within 10 days after delivery such notice to the Systems Integrator, the Systems Integrator confirms to the MBTA in writing that:

- 4.1.1 The Systems Integrator agrees to limit the relevant increase in the APC to ten percent (10%) or less, without any changes in the Initial Term or any Renewal Term, or any other changes in the APC, APO, APT or other Proposal commitments; and
- 4.1.2 The Systems Integrator shall conduct, at its own cost and expense, a timely, transparent process to identify and arrange for the lowest-priced debt financing commercially available on terms reasonably satisfactory to the Systems Integrator, consistent with Section 3.2.2 of this Appendix 14;

provided further, that the MBTA's notice of termination shall be suspended for a maximum period equal to the lesser of (i) the period during which the Systems Integrator diligently pursues such debt financing and (ii) sixty (60) days after the date on which the Systems Integrator shall have provided such confirmation to the MBTA. At the end of the above suspension period the MBTA shall have no right to draw on the Financial Close Security, shall promptly return the Financial Close Security to the Systems Integrator and the obligations of the parties shall be the same as if the Systems Integrator's election pursuant to this Section 4.1 had not occurred. If the MBTA terminates this Project Agreement pursuant to this Section 4.1 and the Systems Integrator shall have complied with all of its obligations under this Project Agreement, the MBTA shall pay the Systems Integrator the Financial Close Termination Sum in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

4.2. Systems Integrator Termination Prior to Financial Close Deadline

The Systems Integrator may terminate this Project Agreement without forfeiting its Financial Close Security if a Key Financial Event occurs and:

- 4.2.1 The MBTA notifies the Systems Integrator that it will not take any action pursuant to Section 3.2 of this Appendix 14;
- 4.2.2 The MBTA takes action pursuant to Section 3.2 of this Appendix 14 but, after taking into account the effect of such action, the Equity IRR would be less than the Equity IRR would have been had the Key Financial Event not occurred; or
- 4.2.3 The MBTA does not, within twenty 25 Business Days of receiving a written request from the Systems Integrator, notify the Systems Integrator of its intent to take any action pursuant to Section 3.2 of this Appendix 14; provided, that the Systems Integrator shall not under such circumstances be required to consummate Financial Close until such period shall have lapsed.

Upon such termination, if the Systems Integrator shall have complied with all of its obligations under this Project Agreement, and so long as the MBTA is not disputing in good faith pursuant to Article 20

whether the Systems Integrator has the right to terminate this Project Agreement, the MBTA shall return to the Systems Integrator the Financial Close Security within 5 Business Days after the MBTA's receipt of notice of such termination shall pay the Systems Integrator the Financial Close Termination Sum in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

5. Implementation of MBTA and Systems Integrator Elections

5.1. To the extent that the MBTA makes an election pursuant to Section 3.2 above or the Systems Integrator issues a written notice pursuant to Section 4.1 above, then:

5.1.1 This Project Agreement will be amended (in a manner agreed between the MBTA and the Systems Integrator) to reflect the relevant action;

5.1.2 If requested by the Systems Integrator, the MBTA will extend the Financial Close Deadline by such time as is reasonable given the action that the MBTA elected to take; provided that the Systems Integrator extends the expiration date of the Financial Close Security to no earlier than 10 Business Days following the extended Financial Close Deadline; and

5.1.3 The Systems Integrator will proceed in taking all actions required to achieve Financial Close in accordance with the requirements of this Project Agreement.

6. Achievement of Financial Close

6.1. The Systems Integrator shall deliver to the MBTA, on or before the Business Day following Financial Close, unrestricted electronic versions of the Financial Model in the form attached hereto as Appendix 15 (Financial Model), which version incorporates any amendments agreed between the Effective Date and the Financial Close Date (including any revision to the APC pursuant to Section 10 of this Appendix 14), together with the books and documents setting forth all assumptions, calculations and methodology used in the preparation of the Financial Model and any other documentation necessary or reasonably requested by the MBTA to operate the Financial Model.

6.2. The Systems Integrator shall deliver to the MBTA, on or before the Business Day following Financial Close, written binding verifications of coverage from the relevant issuers that the Required Insurance to be in place on or before Financial Close under Section 17.1 and Appendix 12 of this Project Agreement has been obtained and are in full force and effect.

6.3. The Systems Integrator shall deliver to the MBTA, on or before the Business Day following Financial Close, proposed revisions to this Project Agreement to reflect any adjustments or amendments which have been accepted or agreed, as applicable, by the MBTA and the Systems Integrator in accordance with Section 10 of this Appendix 14, including the replacement of the Preliminary Financial Model attached hereto as Appendix 15¹ (Preliminary Financial Model) with the Financial Model delivered pursuant to Section 6.1 above (upon agreement of the Parties, acting reasonably, the **“Financial Close Amendment”**).

6.4. Upon the satisfaction of each of the Financial Close Conditions, delivery of confirmation of the Required Insurance in accordance with Section 6.2 and agreement among the Parties, acting reasonably, as to any Financial Close Amendment, (i) the MBTA and the Systems Integrator shall

¹ The Financial Model delivered at Financial Close will be incorporated into Appendix 15 and the Appendix 15 will be renamed at that time.

sign a certificate specifying the Financial Close Date, (ii) the MBTA shall return the Financial Close Security to the Systems Integrator within 5 Business Days, and (iii) the Parties shall enter into the Financial Close Amendment.

7. Failure to Achieve Financial Close by Financial Close Deadline

7.1. MBTA Termination for Failure to Achieve Financial Close Deadline

Provided that (i) no Key Financial Event exists and (ii) this Project Agreement has not been terminated pursuant to Section 4 of Appendix 14, if each MBTA Condition Precedent (other than the conditions specified in Section 2.2.3 and the execution of any agreement under Section 2.2.4) has been satisfied and any Systems Integrator Condition Precedent is not satisfied or waived in writing by the MBTA on or before the Financial Close Deadline, as such date may be extended hereunder due to the occurrence of a Supervening Event, and so long as the Systems Integrator is not disputing in good faith pursuant to Article 20 of the Project Agreement whether or not such Systems Integrator Condition Precedent was satisfied or waived in writing by the MBTA, the MBTA shall have the right to:

- (a) Terminate this Project Agreement in its entirety by written notice to the Systems Integrator with immediate effect; and
- (b) Draw and retain the full amount of the Financial Close Security as the sole remedy of the MBTA against the Systems Integrator hereunder, provided that the MBTA shall not have the right to draw or retain any amount of the Financial Close Security to the extent that the failure of the Systems Integrator to satisfy each Systems Integrator Condition Precedent on or before the Financial Close Deadline is due solely to the occurrence and continuation of an event or circumstance that would constitute a Supervening Event, and not to any act or omission of the Systems Integrator or any Systems Integrator Person.

7.2. Systems Integrator Termination for Failure to Achieve Financial Close Deadline

If each Systems Integrator Condition Precedent (other than the conditions specified in Section 2.1.3 and 2.1.5 (in the case of Section 2.1.5, to the extent such Section requires that representations and warranties be correct as at the Financial Close Date; provided that such representations and warranties are correct as at the date when the Systems Integrator exercises its rights under this Section 7.2)) has been satisfied and any MBTA Condition Precedent is not satisfied (unless otherwise agreed by the Parties) on or before the Financial Close Deadline, then the Systems Integrator shall have the right to terminate this Project Agreement in its entirety by written notice to the MBTA with immediate effect and the MBTA shall have no right to draw on the Financial Close Security. Within 10 days following receipt of such notice in accordance with this Project Agreement, and so long as the MBTA is not disputing in good faith pursuant to Article 20 of the Project Agreement whether the Systems Integrator has the right to terminate this Project Agreement, the MBTA shall return the Financial Close Security to the Systems Integrator and shall pay the Systems Integrator the Financial Close Termination Sum in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

8. MBTA Convenience Termination Right Prior to Financial Close

The MBTA shall have the right of Termination for Convenience in accordance with Section 24.2 of the Project Agreement at any time during the Financing Period. If the MBTA exercises such right, the MBTA shall return the Financial Close Security to the Systems Integrator and shall pay the Systems Integrator

the Financial Close Termination Sum in accordance with and as determined pursuant to Appendix 13 (Termination Compensation).

9. Post Termination Obligations

If this Project Agreement terminates pursuant to this Appendix 14, neither Party shall have any obligation or liability to the other Party, except:

- (a) Any MBTA entitlement to draw on the Financial Close Security as and to the extent provided in this Appendix 14;
- (b) Any obligation of the MBTA to return the Financial Close Security and pay the Financial Close Termination Sum as and to the extent provided in this Appendix 14 and Appendix 13 (Compensation Termination);
- (c) In respect of any antecedent breach of this Project Agreement (except for any breach contemplated in Section 7.1 or Section 7.2); and
- (d) As provided in Section 3.2 of the Project Agreement.

10. Update to the APC

10.1. Changes in Financing Terms

To the extent that the Systems Integrator makes changes to the Benchmark Interest Rate index used or changes in the debt structure (e.g., fixed or variable rate, bank financing or bond financing) prior to Financial Close that constitute a deviation from the assumptions in the Preliminary Financial Model, the Parties agree that, except as may be approved by the MBTA (in its discretion), the MBTA shall provide Benchmark Interest Rate protection in accordance with Section 10.2 of Appendix 14, on the basis of the Benchmark Interest Rates and debt structure included in the Preliminary Financial Model.

10.2. Benchmark Interest Rate Protection

10.2.1 Subject to the MBTA's rights to terminate under this Appendix 14, the MBTA will bear the risk and have the benefit of one hundred percent (100%) of the impact (either positive or negative) on the APC of changes in any Benchmark Interest Rate for the period beginning at 12:01 p.m. (local time Boston, MA) on the Benchmark Interest Rate Protection Start Date and ending on the Benchmark Interest Rate Adjustment Date.

10.2.2 The interest rate adjustment will be based on the movement, if any, in the applicable Benchmark Interest Rate.

10.2.3 The Systems Integrator and the MBTA shall both adjust the Financial Model as of the Financial Close Date to reflect the changes (if any) in any Benchmark Interest Rate and any revisions approved by the Parties.

10.3. APC Update Protocol

The Parties will use the Preliminary Financial Model to calculate the change under Section 10.2 of this Appendix 14, positive or negative, in the APC. The Parties shall make such calculation and produce the Financial Model delivered pursuant to the following:

- 10.3.1 As a means of mitigating against the negative impact of any changes in Benchmark Interest Rates for any Bonds or Bank Debt which is part of the Systems Integrator's financing, as applicable, on the minimum prevailing debt covenants established in the Preliminary Financial Model, the Systems Integrator will optimize, to the extent possible, the maturities and make consequential amendments to the Preliminary Financial Model;
- 10.3.2 The Preliminary Financial Model in the form attached hereto as Appendix 15 (Preliminary Financial Model), subject to any updates from the previous step, shall be run to solve for the lowest possible "interim" APC, inputting only the changes, if any, in Benchmark Interest Rates as described in Section 10.2 of this Appendix 14, and holding the Preliminary Equity IRR constant. As part of this process it will be ensured that the minimum prevailing debt covenants in the Preliminary Financial Model are not breached;
- 10.3.3 The APC shall be determined as the interim APC resulting from the calculations in Section 10.3.2 above;
- 10.3.4 The interim Financial Model resulting from the calculations in Section 10.3.2 above shall be run to solve for the Base Case Equity IRR, inputting (a) the APC determined under Section 10.3.3 above, and (b) all other changes in terms of financing between those assumed and indicated in the Preliminary Financial Model and those set out in the Financing Documents as obtained on the Financial Close Date.
- 10.3.5 Notwithstanding anything in this Appendix 14 to the contrary and without limiting Section 10.1 above, the Systems Integrator shall bear the full risk of changes to any financing terms not explicitly identified within Section 10.3 of this Appendix 14.

APPENDIX 16

DB DISPUTE REVIEW BOARD

1. Requirements for DB Dispute Review Board

1.1 Board Membership

The DB Dispute Review Board shall consist of one member selected by the MBTA, one member selected by the Systems Integrator and a third member selected in accordance with Section 1.7 of this Appendix 16. The third member will act as the “Chairperson” of the DB Disputes Review Board.

1.2 Neutral and Impartial

The members of the DB Dispute Review Board shall be neutral, act impartially, and, without limiting anything under Section 1.4 of this Appendix 16, not have any conflict of interest.

1.3 Experience Criteria

Each member of the DB Dispute Review Board shall be a nationally recognized expert in engineering and construction matters pertinent to the technical nature of the Project and the DB Installation Work. The Chairperson shall be a nationally recognized expert in matters pertinent to the resolution of commercial disputes outside of litigation and shall have served on at least one dispute review board, preferably as Chairperson. The Parties may agree to permit exceptions to the foregoing experience criteria.

1.4 Additional Criteria Regarding Independence of Board Members

Without limiting the requirements of Section 1.3 of this Appendix 16, each member of the DB Dispute Review Board shall meet the following criteria (unless otherwise waived by the Parties by mutual agreement):

- 1.4.1 No member shall have an ownership interest in any party involved in this Project Agreement, an ownership interest in a subcontractor or material supplier on the Project, or a financial interest in this Project Agreement, except for payment for services on the DB Dispute Review Board. For purposes of determining conflicts of interests and disqualification under Section 1.10, the term “member” shall include the member’s current primary or full-time employer, and “involved” shall mean having a contractual relationship with the MBTA or the Systems Integrator at any tier.
- 1.4.2 Except for fee-based consulting services on other projects, no member shall have been previously employed by, or have had financial ties to, any party involved in the Project Agreement within a period of seven years prior to award of the Project Agreement.
- 1.4.3 No member shall have provided to either Party fee-based consulting services within the two years prior to award of the Project Agreement, where the consulting fees paid by that Party have exceeded 20% of that member’s total consulting revenue in either year.

- 1.4.4 No member shall have had a close professional or personal relationship with any key member of any party involved in the Project Agreement which, in the judgment of either Party, could suggest partiality, or give an appearance of impropriety.
- 1.4.5 No member shall have had prior involvement in the Project, of a nature which could compromise his or her ability to participate impartially as a member.
- 1.4.6 During his or her tenure as a member of the DB Dispute Review Board, no member shall be employed, including fee-based consulting services, by any party involved in this Agreement or subcontractor or material supplier on the Project, except with express approval of both Parties.
- 1.4.7 During his or her tenure as a member of the DB Dispute Review Board, no member shall engage in any discussion or make any agreement with any Party regarding employment after the Project is completed.

1.5 Disclosure Statements

Before their appointments are final, the first prospective members of the DB Dispute Review Board selected by the MBTA or the Systems Integrator shall submit complete disclosure statements for the approval of both the MBTA and the Systems Integrator. Each statement shall include a resume of experience, together with a declaration describing all past, present and anticipated or planned future relationships (including indirect relationships through the prospective member's primary or full-time employer) to this Project and with all parties involved in this Project Agreement. This disclosure shall also include any financial relationship relative to the criteria in Section 1.4 of this Appendix 16, and disclosure of close relationships, either professional or personal, with all key members of the Parties. The third member of the DB Dispute Review Board shall supply such a statement to the other members and to the Parties before his or her appointment is final.

1.6 Selection of First Members

The MBTA and the Systems Integrator shall each select its proposed member for the DB Dispute Review Board and convey the selected member's name and reference information to the other Party within 90 days after the Effective Date. If either Party reasonably believes that the member proposed for appointment by the other Party does not meet the criteria for membership as set forth in this Appendix 16, that Party shall notify the other Party in writing of such failure and the reason therefor within 10 Business Days of receiving notice of the Party's selection. If either Party's member fails to meet the criteria, the other Party may require substitution of that member pursuant to Section 1.10 of this Appendix 16.

1.7 Selection of Chairperson

The following procedures shall be used to select the Chairperson:

- 1.7.1 Promptly after the MBTA and Systems Integrator selections for the DB Dispute Review Board are final, the MBTA and the Systems Integrator shall agree on a list of three proposed members acceptable to both Parties, and the MBTA shall provide this list to the first members of the DB Dispute Review Board and notify such members to begin the process of selecting the final member from this list. The first members shall select the final member from the list provided by the MBTA and shall ensure that the final member meets all of the relevant criteria set forth in this Appendix 16. The first members shall

select the final member within 10 Business Days after they receive the notice from the MBTA to begin the selection process.

- 1.7.2 If the first members of the DB Dispute Review Board do not select a final member within the 10 Business Days allotted, the Parties shall select the third member by mutual agreement. In so doing, the Parties may, but are not required to, consider other nominees offered by the first two members of the DB Dispute Review Board. In the event of failure to agree on the appointment of the final member of the DB Dispute Review Board within a further 10 Business Days, such person may be appointed by the International Institute for Conflict Prevention and Resolution, upon the request of either Party.

1.8 Duties of the Chairperson

In addition to serving as a member of the DB Disputes Review Board, the Chairperson's duties include conducting the DB Dispute Review Board meetings, resolving procedural issues, ensuring that all parties are notified of the DB Dispute Review Board's meeting schedule, and performing other tasks as necessary for the operation of the DB Dispute Review Board.

1.9 DB Dispute Review Board Agreement

The MBTA, the Systems Integrator and all members of the DB Dispute Review Board shall execute the "DB Dispute Review Board Agreement" substantially in the form set forth as attachment 16-A to this Appendix 16 within 30 days after the selection of the Chairperson.

1.10 Disqualification, Withdrawal and Replacement

Any member of the DB Dispute Review Board shall be disqualified from serving as a member of the DB Dispute Review Board if such member:

- 1.10.1 Has a discussion regarding employment or enters into any employment agreement with the MBTA, the Systems Integrator or any person involved in the Project (within the meaning of Section 1.4.1 of this Appendix 16) during his or her tenure on the DB Dispute Review Board;
- 1.10.2 Is discovered not to meet the relevant qualifications set forth in this Appendix 16; or
- 1.10.3 Resigns or otherwise cannot continue to serve because of death, illness or permanent disability.

In the event of such a disqualification, a replacement member meeting the qualifications set forth in this Appendix 16 (unless otherwise waived by mutual agreement of the Parties) shall be selected by the Party that selected the disqualified member or, in the case of the Chairperson, both Parties in accordance with the procedures set forth in this Appendix 16.

2. Responsibilities of the Parties

2.1 Systems Integrator Responsibilities

Except for its participation in the DB Dispute Review Board's activities as provided in the DB Dispute Review Board Agreement, the Systems Integrator shall not solicit advice or consultation from the DB

Dispute Review Board or any member thereof on matters dealing in any way with the Project. The Systems Integrator shall furnish to each DB Dispute Review Board member, with a copy to the MBTA, a set of all pertinent documents which are or may become necessary for the DB Dispute Review Board to perform its function, except documents furnished by the MBTA.

2.2 MBTA Responsibilities

Except for its participation in the DB Dispute Review Board's activities as provided in the DB Dispute Review Board Agreement, the MBTA shall not solicit advice or consultation from the DB Dispute Review Board or any member thereof on matters dealing in any way with the Project. The MBTA shall furnish each DB Dispute Review Board member, with a copy to the Systems Integrator, a set of all pertinent documents necessary for the DB Dispute Review Board to perform its function, including this Project Agreement, the DB Contract and all related contract documents. The MBTA, in cooperation with the Systems Integrator, shall coordinate the operations of the DB Dispute Review Board and arrange or provide conference facilities at or near MBTA offices for meetings of the DB Dispute Review Board.

2.3 Reports to the DB Dispute Review Board

The MBTA and the Systems Integrator shall cooperate to provide the DB Dispute Review Board members with monthly reports, minutes of progress meetings, and other relevant information they each prepare in order to keep the DB Dispute Review Board informed of Project-related activity and other developments.

2.4 Quarterly Meetings

Upon the establishment of the DB Dispute Review Board and throughout the Implementation Period, the members of the DB Dispute Review Board shall meet at least once quarterly. Each such meeting shall occur at a location to be determined by the Parties, acting reasonably, and shall consist of a roundtable discussion of the status of the Project and the DB Installation Work, followed by field observation of the work (to the extent deemed necessary by the DB Dispute Review Board members). Representatives from the MBTA, the Systems Integrator and the DB Entity shall be present at such meetings; provided that, during any ongoing DB Dispute(s), the Parties may mutually agree to postpone or forego a quarterly meeting if such meeting could reasonably be expected to interfere with such ongoing proceedings or otherwise be reasonably considered unnecessary to maintaining the DB Dispute Review Board members' knowledge of the status of the Project and the DB Installation Work.

3. Compensation and Payment

All DB Dispute Review Board members shall receive the same compensation for services, as reasonably agreed to by the Parties. The Systems Integrator shall pay 100% of the amount properly payable to, and invoiced by, the DB Dispute Review Board members in accordance with the DB Dispute Review Board Agreement on a monthly basis and shall invoice the MBTA monthly for 50% of the amount paid. The MBTA shall pay the Systems Integrator the amount invoiced in accordance with this Section within 30 days of its receipt of the invoice from the Systems Integrator.

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ATTACHMENT 16-A
FORM OF DB DISPUTE REVIEW BOARD AGREEMENT

This DB Dispute Review Board Agreement (“**Agreement**”) is made and entered into as of _____, 2017, between the Massachusetts Bay Transportation Authority, a body politic and corporate and a political subdivision of the Commonwealth of Massachusetts (the “**MBTA**”), [SYSTEMS INTEGRATOR], a _____, organized and existing under the laws of _____ (the “**Systems Integrator**”), and [LIST EACH OF THE MEMBERS] (collectively, the “**Members**”).

RECITALS

WHEREAS, the MBTA is a political subdivision of the Commonwealth of Massachusetts (the “**Commonwealth**”), established under the provisions of M.G.L. c. 161A (the “**Act**”), and is responsible for providing public transportation services in certain areas of the Commonwealth; and

WHEREAS, the MBTA has determined to implement a new automated, account-based open fare collection system (the “**System**”) to serve the MBTA, with the capability of expansion to other transportation agencies, modes and services in order to make public transportation services a seamless network as viewed by travelers in the region;

WHEREAS, the MBTA and the Systems Integrator have entered into a Project Agreement dated [_____] (the “**Project Agreement**”) in connection with the design, implementation, installation, integration, testing, financing, operation and maintenance of the System, as more fully described in the Project Agreement;

WHEREAS, the MBTA has entered into the DB Contract (as defined in the Project Agreement) with [DB ENTITY] to provide for the performance of the DB Installation Work (as defined in the Project Agreement); and

WHEREAS, Article 20 of the Project Agreement provides for the establishment and operation of a DB Dispute Review Board (as defined in the Project Agreement) to assist in resolving any DB Dispute (as defined in the Project Agreement).

NOW THEREFORE, in consideration of the mutual promises and agreements of the parties herein expressed and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto covenant and agree as follows:

1. Establishment of Board

1.1 The DB Dispute Review Board (the “**Board**”) shall begin operation upon execution of this Agreement by the MBTA, the Systems Integrator and all Board Members. Tenure of the Board Members shall terminate at the time specified in Section 20.2(A) of the Project Agreement.

1.2 Each Board Member represents, warrants and covenants on his or her behalf that he or she complies with the criteria and limitations for membership described in Appendix 16 of the Project Agreement.

1.3 Each Board Member shall have submitted and received approval of disclosure statements according to the requirements of Section 1.5 of Appendix 16 to the Project Agreement.

1.4 If during the term of this Agreement, a Board Member has a discussion regarding employment or enters into any agreement for employment with the MBTA, the Systems Integrator or any Systems Integrator Person (as defined in the Project Agreement), the Board Member shall immediately disclose such discussion or agreement to both the MBTA and the Systems Integrator, and the Board Member shall be disqualified from serving on the Board.

2. Board Responsibilities

2.1 The Board shall fairly and impartially consider and provide written decisions for resolution of DB Disputes in accordance with Section 22 of the Project Agreement and Appendix 16 attached thereto. The Board Members shall perform the services necessary to participate in the Board's actions in accordance with this Agreement.

2.2 Board Members shall keep themselves informed concerning matters related to potential DB Disputes by reviewing documents provided in accordance with Section 4 of this Agreement to the extent necessary to perform their responsibilities under this Agreement.

2.3 Commencing with the establishment of the Board and throughout the Implementation Period (as defined in the Project Agreement), Board Members shall meet at least once quarterly in accordance with and subject to Section 2.4 of Appendix 16 to the Project Agreement.

2.4 All Board Members are to act independently in the consideration of facts and conditions surrounding any DB Dispute. Seeking the Board Members' advice or consultation, ex parte, is expressly prohibited; provided, that either the MBTA or the Systems Integrator may seek such advice or consultation from the entire Board, at a Board meeting, after first giving notice to all interested parties. A Board Member who has ex parte contact with the MBTA or the Systems Integrator or a representative of either such party shall be subject to disqualification and removal from the Board for cause.

2.5 Board Members may withdraw from the Board upon delivery of written notice of withdrawal to the MBTA, the Systems Integrator and the other Board Members, which notice shall specify a withdrawal date at least 30 days following the date of delivery of the notice. In addition, a Board Member may be terminated by the MBTA or the Systems Integrator if at any time that Board Member fails to meet the relevant qualifications set forth in, or is otherwise disqualified pursuant to Appendix 16 to the Project Agreement. Should the need arise to appoint a replacement Board Member, the replacement member shall be appointed in the same manner as provided by the Project Agreement for appointment of the original member. The selection of a replacement Board Member shall begin promptly upon notification of the necessity for a replacement and shall be completed within 30 days thereafter. The change in Board membership shall be evidenced by the new member's signature on this Agreement.

2.6 The personal services of a Board Member are a condition to receiving payment hereunder. No Board Member may assign any of his or her work pursuant to this Agreement without the prior written consent of both the MBTA and the Systems Integrator.

2.7 Each Board Member shall keep matters related to this Agreement confidential to the extent permitted by applicable law.

2.8 Each Board Member, in the performance of his or her duties on the Board, is acting as an independent contractor and not as an employee of either the MBTA or the Systems Integrator. No Board Member will be entitled to any employee benefits.

2.9 The Chairperson (as defined in Appendix 16 to the Project Agreement) shall be appointed in accordance with Section 1.7 of Appendix 16 to the Project Agreement and shall have the duties specified in Section 1.8 of Appendix 16 to the Project Agreement.

3. Hearings and Decisions

3.1 Each DB Dispute shall be heard and decided by the Board in accordance with the procedures and timelines established in Section 20.2 of the Project Agreement. The Chairperson's vote on all matters decided by the Board is equal to that of the other members. All Disputes presented to the Board shall be decided by agreement of a majority of the Board's members.

3.2 Within the limits set by Section 20.2 of the Project Agreement, the Board shall have the right to establish its own procedures and time limits, including the right to establish or to waive evidentiary rules and procedures. Each party involved in a DB Dispute shall retain the right to discovery, within the parameters set by the Board.

4. Provision of Documents to the Board

4.1 The MBTA shall furnish each Board Member one copy of Project-related documents in accordance with Section 2.2 of Appendix 16 to the Project Agreement.

4.2 The Systems Integrator shall furnish to each Board Member one copy of all Project-related documents required in accordance with Section 2.1 of Appendix 16 to the Project Agreement.

4.3 The MBTA and the Systems Integrator shall cooperate to provide Board Members with monthly reports, minutes of progress meetings, and other relevant information they each prepare in order to keep the DB Dispute Review Board informed of Project-related activity and other developments.

5. Payment

5.1 The Systems Integrator shall be responsible for making all payments required under this Agreement, subject to reimbursement from the MBTA in accordance with and to the extent provided in Section 3 of Appendix 16 to the Project Agreement.

5.2 *[Fees payable to be agreed upon between the Parties, acting reasonably.]*

5.3 Invoices for payment for Board Member work completed under this Agreement shall be submitted to the Systems Integrator monthly. Such invoices shall be in a format approved by the MBTA and the Systems Integrator and accompanied by a general description of activities performed during the relevant period. Billings for expenses shall include an itemized listing supported by copies of the original bills, invoices, expense accounts and miscellaneous supporting data.

5.4 Each Board Member shall keep available for inspection, for a period of five years after final payment, the cost records and accounts pertaining to this Agreement.

6. Miscellaneous

6.1 This Agreement shall commence upon execution hereof by the Systems Integrator, the MBTA and all Board Members, subject to the right of the MBTA and the Systems Integrator to terminate the services of Board Members as specified herein. This Agreement shall terminate automatically upon

termination of the Project Agreement and, absent such termination, shall continue for the period of tenure of the Board Members, as specified in Section 1.1.

6.2 The parties to this Agreement intend for Section 20.2 of, and Appendix 16 to, the Project Agreement and the other terms of this Agreement to be complementary. Except as otherwise specifically provided herein, in the event of any conflict between this Agreement and Section 20.2 of, and Appendix 16 to, the Project Agreement, such referenced provisions of the Project Agreement shall control.

6.3 Notices hereunder shall be effective if provided in accordance with Section 25.12 of the Project Agreement. The addresses for the Board Members are set forth on the signature pages hereof.

6.4 This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts (without regard to conflict of laws principles thereunder).

6.5 It is the express intention of the parties hereto that any dispute arising under this Agreement shall be solely and exclusively initiated and maintained in state or federal courts located in the City of Boston, County of Suffolk, Commonwealth of Massachusetts. The parties hereto each irrevocably consents to the jurisdiction of such courts and waives any objection it may have to the laying of the jurisdiction of any such courts in relation to proceedings in connection with this Agreement.

6.6 This Agreement may be executed in counterparts, which together shall constitute one and the same instrument.

[Signature page to be provided.]

FORM OF FINANCIAL CLOSE SECURITY

for

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES

between

THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

and

[LOC ISSUER]

Dated

[_____, 2017]

TRANSACTION FORM A
FINANCIAL CLOSE SECURITY

IRREVOCABLE STANDBY LETTER OF CREDIT

ISSUER:

PLACE FOR PRESENTATION OF DRAFT:

(Name and Address of Bank/Branch – MUST be a domestic Qualified Commercial Bank or the Boston or New York branch or agency of a foreign Qualified Commercial Bank)

APPLICANT:

BENEFICIARY: MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

LETTER OF CREDIT NUMBER:

PLACE AND DATE OF ISSUE:

AMOUNT: *[Must be in an aggregate amount equal to three million United States dollars (US \$3,000,000)]*

EXPIRATION DATE: *[Must be no earlier than 10 Business Days following the Financial Close Deadline]*

The Issuer issues this Irrevocable Standby Letter of Credit in favor of the Massachusetts Bay Transportation Authority, for any sum or sums up to the aggregate amount of **Three Million United States Dollars (US \$3,000,000)**, available by draft at sight drawn on the Issuer. Any draft under this Irrevocable Standby Letter of Credit shall:

1. Identify this Irrevocable Standby Letter of Credit by the name of the Issuer, and the Letter of Credit number, amount, and place and date of issue; and
2. State the following:

“This drawing is due to _____ [Applicant’s Name] _____’s failure to perform any of the obligations listed in Appendix 14 (Financial Close Procedures and Conditions) to the Project Agreement, dated as of [_____, 2017] (the “Project Agreement”), by and between the MBTA and [Systems Integrator] (the “Systems Integrator”).

All drafts will be honored if presented to _____ [Name & Address] _____ on or before the Expiration Date described above or any extended expiration date.

Drawings by facsimile to facsimile number [() _____] are acceptable (each such drawing, a "Fax Drawing") provided, however, that a Fax Drawing will not be effectively presented until Beneficiary confirms, by telephone, Issuer's receipt of such Fax Drawing by calling Issuer at telephone number [() _____]. Issuer will acknowledge Beneficiary's presentment by e-mail to the e-mail address provided to Issuer in the Fax Drawing.

If a Demand for Payment is made by you hereunder at or prior to 10:00 a.m., Eastern time, on any weekday (i.e., Monday through Friday, excluding Commonwealth holidays and US federal holidays) (a "Business Day"), and provided that such Demand for Payment conforms to the terms and conditions hereof, payment shall be made by us to you in immediately available funds free and clear of and without deduction for any taxes, duties, fees, liens, set-offs or other deductions of any kind and regardless of any objection by any third party (subject to any court order or judgment), to the account designated below or such other account at a national bank in the United States of America that you may designate in the Demand for Payment on the next Business Day after demand is made. If a Demand for Payment is made by you hereunder after 10:00 a.m., Eastern time, on a Business Day, and provided that such Demand for Payment conforms to the terms and conditions hereof, such payment shall be made no later than our close of business, local time of the location of the account designated below or such other account at a national bank in the United States of America that you may designate in the Demand for Payment, on the second Business Day after demand is made. Payment under this Letter of Credit shall be made in same day funds, by wire transfer to your account described below or such other account as you may designate in writing.

This Letter of Credit shall be automatically extended for successive periods of one year, without amendment, from the stated expiration date and each extended expiration date unless we send the Massachusetts Bay Transportation Authority written notice of our intent not to extend the credit; which notice must be sent at least 30 days prior to the expiration date of the original term hereof or any extended one year term, by registered or certified mail or overnight courier, to Ten Park Plaza, Suite 2810, Boston MA 02116-3974, or any other address specified in writing to the Issuer at the above address by the Massachusetts Bay Transportation Authority. Notice to the Massachusetts Bay Transportation Authority that this Letter of Credit will not be extended, shall be deemed a default.

This Letter of Credit is subject to the rules of the "International Standby Practices" ISP98, if a conflict between ISP98 and Massachusetts law should arise, Commonwealth of Massachusetts law shall prevail, without regard to principals of conflicts of law.

Any failure by you to draw upon this Letter of Credit as permitted hereunder shall not cause this Letter of Credit to be unavailable for any future drawing, provided that this Letter of Credit has not expired prior to such future drawing and that all requirements of this Letter of Credit are independently satisfied with respect to any such future drawing.

[Select if the LOC Issuer has an office in Massachusetts.] [If legal proceedings are initiated by any party with respect to payment of the Letter of Credit, we agree that such proceeding shall be subject to Massachusetts courts and law and the venue for such proceeding shall be in the Superior Court for the County of Suffolk, Massachusetts.]

[Select if the LOC Issuer does not have an office in Massachusetts.] [If legal proceedings are initiated by any party with respect to payment of the Letter of Credit, we agree that such proceeding shall be subject to New York courts and law and the venue for such proceeding shall be subject to jurisdiction and venue in the State of New York.]

Issuer: _____

By: _____
(Authorized signature of Issuer)

LENDERS' REMEDIES AGREEMENT

for

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES

between

THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

and

[SYSTEMS INTEGRATOR]

and

[COLLATERAL AGENT]

Dated

[_____, 2017]

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TABLE OF CONTENTS

Page

ARTICLE 1

DEFINITIONS AND INTERPRETATION

| | | |
|--------------|-------------------------------------|---|
| SECTION 1.1. | DEFINITIONS | 1 |
| SECTION 1.2. | INTERPRETATION | 6 |
| SECTION 1.3. | ORDER OF PRECEDENCE..... | 8 |
| SECTION 1.4. | NO EFFECT ON PROJECT AGREEMENT..... | 8 |
| SECTION 1.5. | NO GREATER RIGHTS | 8 |

ARTICLE 2

CONSENT TO SECURITY

| | | |
|--------------|----------------------------------|---|
| SECTION 2.1. | CONSENT | 8 |
| SECTION 2.2. | MBTA OBLIGATIONS..... | 9 |
| SECTION 2.3. | NO NOTICE OF OTHER SECURITY..... | 9 |

ARTICLE 3

NOTICES

| | | |
|--------------|---|----|
| SECTION 3.1. | MBTA'S NOTICE | 9 |
| SECTION 3.2. | COLLATERAL AGENT NOTICE..... | 10 |
| SECTION 3.3. | MBTA PAYMENTS UNDER THE PROJECT AGREEMENT | 10 |

ARTICLE 4

RIGHTS AND OBLIGATIONS DURING THE CURE PERIOD

| | | |
|--------------|---|----|
| SECTION 4.1. | GENERALLY | 10 |
| SECTION 4.2. | COLLATERAL AGENT'S RIGHT TO CURE A SYSTEMS INTEGRATOR BREACH OR DEFAULT WITHOUT STEP-IN OR TRANSFER | 11 |

ARTICLE 5

STEP-IN

| | | |
|--------------|---|----|
| SECTION 5.1. | COLLATERAL AGENT'S STEP-IN NOTICE | 11 |
| SECTION 5.2. | RIGHTS AND OBLIGATIONS ON STEP-IN | 12 |

ARTICLE 6

STEP-OUT

TABLE OF CONTENTS
(continued)

| | Page |
|------------------------------------|------|
| SECTION 6.1. STEP-OUT NOTICE | 14 |

ARTICLE 7

SUBSTITUTION NOTICE

| | |
|--|----|
| SECTION 7.1. NOTICE OF SUBSTITUTE | 14 |
| SECTION 7.2. GROUNDS FOR REFUSING APPROVAL | 14 |
| SECTION 7.3. PROVISION OF INFORMATION..... | 15 |
| SECTION 7.4. DEEMED APPROVAL | 15 |

ARTICLE 8

SUBSTITUTION

| | |
|--|----|
| SECTION 8.1. SUBSTITUTION EFFECTIVE DATE..... | 16 |
| SECTION 8.2. EFFECTIVENESS OF SUBSTITUTION | 16 |
| SECTION 8.3. FACILITATION OF TRANSFER..... | 16 |
| SECTION 8.4. SETTLEMENT OF OUTSTANDING FINANCIAL LIABILITIES | 16 |
| SECTION 8.5. CONSEQUENCES OF SUBSTITUTION..... | 16 |

ARTICLE 9

REINSTATEMENT OF REMEDIES

ARTICLE 10

IMPACT OF BANKRUPTCY OR INSOLVENCY PROCEEDINGS

| | |
|--|----|
| SECTION 10.1. REJECTION OF THE PROJECT AGREEMENT | 17 |
| SECTION 10.2. EXTENSION OF CURE PERIOD COMPLETION DATE | 18 |

ARTICLE 11

TERMINATION OF THIS AGREEMENT

ARTICLE 12

PRESERVATION OF FUNDS

ARTICLE 13

COMPETING STEP-IN RIGHTS

| | | |
|---------------|------------------------------------|----|
| SECTION 13.1. | SUBORDINATION OF MBTA RIGHTS | 19 |
| SECTION 13.2. | FORBEARANCE..... | 19 |
| SECTION 13.3. | EXPIRY OF LENDER RIGHTS | 19 |

ARTICLE 14

ASSIGNMENT

| | | |
|---------------|--------------------------------------|----|
| SECTION 14.1. | RESTRICTION ON ASSIGNMENT | 20 |
| SECTION 14.2. | ASSIGNMENT BY COLLATERAL AGENT | 20 |
| SECTION 14.3. | NEW AGREEMENT | 20 |
| SECTION 14.4. | SUCCESSORS AND ASSIGNS..... | 20 |

ARTICLE 15

GENERAL

| | | |
|----------------|--|----|
| SECTION 15.1. | REPRESENTATIONS AND WARRANTIES | 20 |
| SECTION 15.2. | NO MBTA OR COMMONWEALTH RESPONSIBILITY FOR PROJECT DEBT | 21 |
| SECTION 15.3. | COLLATERAL AGENT LIABILITY..... | 21 |
| SECTION 15.4. | SEVERABILITY | 22 |
| SECTION 15.5. | ENTIRE AGREEMENT | 22 |
| SECTION 15.6. | VENUE | 22 |
| SECTION 15.7. | WAIVER..... | 22 |
| SECTION 15.8. | PRIOR CONTRACTS SUPERSEDED | 22 |
| SECTION 15.9. | COUNTERPARTS..... | 22 |
| SECTION 15.10. | NO PARTNERSHIP | 23 |
| SECTION 15.11. | NO THIRD-PARTY BENEFICIARIES | 23 |
| SECTION 15.12. | DISPUTES | 23 |
| SECTION 15.13. | NO INTERFERENCE..... | 23 |
| SECTION 15.14. | EFFECT OF BREACH | 23 |
| SECTION 15.15. | CONFIDENTIALITY | 23 |
| SECTION 15.16. | NOTICES | 23 |

LENDERS' REMEDIES AGREEMENTS

THIS LENDERS' REMEDIES AGREEMENT (this "Agreement") is made and entered into as of _____, 2017, between the Massachusetts Bay Transportation Authority (the "MBTA"), [Collateral Agent], organized and existing under the laws of [___] and authorized to do business in the Commonwealth of Massachusetts, acting as Collateral Agent to the Lenders pursuant to the Security Documents (as defined below) (the "Collateral Agent"), and [Systems Integrator], a [___] company, organized and existing under the laws of the [___] and authorized to do business in the Commonwealth of Massachusetts (the "Systems Integrator").

RECITALS

WHEREAS, the MBTA and the Systems Integrator have entered into a Project Agreement, dated as of [_____,] 2017, as the same may be amended or modified from time to time (the "Project Agreement"), for the design, implementation, installation, integration, testing, financing, operation, maintenance and management of an automated fare collections system, as more fully described in the Project Agreement (the "Project");

WHEREAS, pursuant to the Funding Agreements (as defined in the Project Agreement), as the same may be modified, replaced or amended from time to time, various providers (collectively, the "Lenders") have agreed, subject to the terms and conditions contained therein, to make available to the Systems Integrator the loan facility specified therein to finance certain costs to be incurred and expenditures made by the Systems Integrator in connection with the Project Agreement;

WHEREAS, the Collateral Agent is the collateral agent for the Lenders of such senior Project debt (the "Project Debt") to the Systems Integrator, pursuant to the Security Documents (as defined in the Project Agreement), as the same may be modified, replaced or amended from time to time; and

WHEREAS, it is a condition precedent to both Financial Close under and as defined in the Project Agreement and to closing and funding of the Project Debt under the Financing Documents that the parties hereto execute and deliver this Agreement.

NOW, THEREFORE, in consideration of the mutual promises and agreements of the parties herein expressed and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties covenant and agree as follows:

ARTICLE 1

DEFINITIONS AND INTERPRETATION

SECTION 1.1. DEFINITIONS. Unless otherwise specified or the context otherwise requires, capitalized but otherwise undefined terms in this Agreement shall have the respective meanings given to such terms in the Project Agreement, and:

"Agreement" means this agreement including any recitals, schedules and appendices to this agreement, as amended, supplemented or restated from time to time.

"Bankruptcy Law" means the United States Bankruptcy Code, 11 U.S.C. 101 et seq., as amended from time to time and any successor statute thereto. "Bankruptcy Law" shall also include any

similar state law relating to bankruptcy, insolvency, the rights and remedies of creditors, the appointment of receivers or the liquidation of companies and estates that are unable to pay their debts when due.

“Bankruptcy Officer” means any trustee, receiver, liquidator, sequestrator, administrator or other custodian in connection with the bankruptcy of the Systems Integrator or any of its assets.

“Bankruptcy Proceedings” means:

(1) any:

(a) formal step (including petition, proposal, application, convening of a meeting or other proceeding) taken with a view to or for the purpose of considering;

(b) appointment of an Bankruptcy Officer in connection with;

(c) order or resolution passed in connection with; or

(d) formal agreement reached regarding,

a dissolution, bankruptcy, receivership, winding-up, liquidation, administration or other similar proceedings or any other proceeding seeking a stay of proceedings, reorganization, debt arrangement, compromise of the claims of creditors or any distribution of assets in respect of the Systems Integrator (whether voluntary or involuntary) made or commenced by any party under any Bankruptcy Law; or

(2) any distress, attachment, sequestration or execution or other similar process affecting any of the assets of the Systems Integrator or any other similar process or event occurring in relation to the Systems Integrator's assets in any other jurisdiction.

“Collateral Agent Notice” has the meaning set forth in Section 3.2.

“Collateral Agent Cure Notice” has the meaning set forth in Section 4.2.

“Cure Period” has the meaning set forth in Section 4.2.

“Cure Period Completion Date” means, subject to Section 10.2:

(1) with respect to any failure to deposit, or cause the deposit of, Fare Revenues to the account designated by the MBTA, the date falling five Business Days after the later of (i) the date that the Collateral Agent receives the relevant MBTA notice, and (ii) expiration of any applicable Cure Period granted to the Systems Integrator pursuant to Article 22 of the Project Agreement;

(2) with respect to any payment default, the date falling 30 days after the later of (i) the date that the Collateral Agent receives the relevant MBTA notice, and (ii) expiration of any applicable Cure Period granted to the Systems Integrator pursuant to Article 22 of the Project Agreement;

(3) with respect to any default in respect of a Bankruptcy Related Event, the date falling 90 days after the later of (i) the date that the Collateral Agent receives the relevant MBTA notice, and (ii) expiration of any applicable Cure Period granted to the Systems Integrator pursuant to Article 22 of the Project Agreement;

(4) with respect to any default for failure to achieve the Full Service Commencement Date, the date falling 90 days after the date that the Collateral Agent receives the relevant MBTA notice; provided, that such period shall be extended by such reasonable period of time as may be required to achieve the Full Service Commencement Date (subject to a maximum extension of 275 days), but only to the extent that:

(a) there is a reasonable prospect of achieving the Full Service Commencement Date within 365 days of the relevant MBTA notice; and

(b) within the 90 day period, the Collateral Agent and the MBTA (each acting reasonably) agree to a plan in relation to achieving the Full Service Commencement Date; and

(5) with respect to any Default Event not referred to in clauses (1) through (4) above, the date falling 90 days after the later of (i) the date that the relevant MBTA notice is received by the Collateral Agent, and (ii) expiration of any applicable Cure Period granted to the Systems Integrator pursuant to Article 22 of the Project Agreement; provided, that such period shall, at the request of the Collateral Agent, be extended up to a maximum of 60 additional days, but only to the extent that:

(a) within the aforementioned 90 day period, the Collateral Agent and the MBTA (each acting reasonably) agree to a plan specifying the remedial action to be taken in respect of the relevant Default Event; and

(b) the extension requested by the Collateral Agent represents (in the reasonable opinion of the MBTA) a reasonable period of time to remedy the relevant Default Event.

“Default Event” means any Default Event, as defined in the Financing Documents.

“Designated Account” means [□].

“Financing Documents” means the Security Documents and the Funding Agreements, together with any other documents designated as such by the Parties in accordance with the terms and conditions of the Project Agreement.

“Funding Agreements” means the documents identified as such in Attachment 3 to this Agreement.

“Lenders’ Representative” means:

- (1) the Collateral Agent or Lender;
- (2) a receiver of the Systems Integrator appointed under or in connection with the Security Documents; or
- (3) any other person approved by the MBTA (such approval not to be unreasonably withheld or delayed).

“MBTA Notice” has the meaning given in Section 3.1.

“**Person**” has the meaning given in Section 1.2.

“**Project Agreement**” means the Project Agreement for the design, implementation, installation, integration, testing, financing, operation, maintenance and management of the Automated Fare Collections System between the MBTA and the Systems Integrator dated [_____, 2017], including all Appendices and amendments thereto.

“**Property**” means any right or interest in or to property of any kind whatsoever, whether real, personal or mixed and whether tangible or intangible.

“**Qualified Substitute Systems Integrator**” means a person that is not a Restricted Person and that is approved by the MBTA (such approval not to be withheld if the conditions set forth herein are satisfied) as:

(1) having the legal capacity, power and authority to become a party to and perform the obligations of the Systems Integrator under the Project Agreement; and

(2) employing persons having the appropriate qualifications, experience and technical competence and having the resources available to it (including committed financial resources and sub-contracts) which are sufficient to enable it to perform the obligations of the Systems Integrator under the Project Agreement.

“**Restricted Action**” means the exercise of any right to:

(1) cancel, terminate, step in, novate, expropriate, condemn, or take any other action that may result in the MBTA having a right to take any such action;

(2) cancel, step-in, novate or otherwise assume (whether directly or through a substitute entity) the benefit or burden of the Systems Integrator’s rights against, or obligations to, the Project Contractors;

(3) without limiting any of the MBTA’s rights under Section 21.5 (MBTA’s Step-in Rights), make any claim or take any action or enforce any rights under or in connection with any collateral agreement or security agreement entered into by the MBTA, any Project Contractor or the Systems Integrator, but does not include the exercise of any of the MBTA’s rights under Section 5.10 or Section 21.6 of the Project Agreement or any rights of the MBTA as beneficiary under any letter of credit provided by the Systems Integrator under Article 19 of the Project Agreement; or

(4) issue any notice to the Systems Integrator regarding any of the actions in (1) to (3) above.

“**Restricted Person**” means any person who (or any member of a group of persons acting together, any one of which):

(1) Is disbarred, suspended, or otherwise disqualified from federal, Commonwealth, or MBTA contracting for any services similar in nature;

(2) Was or is subject to any material claim of the United States, Commonwealth or MBTA in any proceedings (including regulatory proceedings) which have been concluded or are pending at the time at which the determination of whether the person falls within this definition is

being made, and which (in respect of any such pending claim, if it were to be successful) would, in the MBTA's view, in either case, be reasonably likely to materially and adversely affect the ability of the Collateral Agent to perform its obligations under this Agreement;

(3) In the case of an individual, he or she (or in the case of a legal entity, any of the members of the board of directors or its senior executive managers) has been sentenced to imprisonment or otherwise given a custodial sentence for any criminal offense (other than minor traffic offences or misdemeanors) less than five years prior to the date at which the determination of whether the person falls within this definition is being made;

(4) Has, directly or indirectly, its principal or controlling office in a country that is subject to any economic or political sanctions imposed by the United States for reasons other than its trade or economic policies;

(5) Has as its primary business the illegal manufacture, sale, distribution or promotion of narcotic substances or arms, or is or has been involved in terrorism; or

(6) Has as its primary business the acquisition of distressed assets or investments in companies or organizations which are or are believed to be insolvent or in a financial standstill situation or potentially insolvent.

"Security Documents" means the documents identified as such in Attachment 3 to this Agreement.

"Step-In Date" means the earlier of: (i) five Business Days after delivery of a Step-In Notice or (ii) the date described in Section 5.1(b).

"Step-in Entity" has the meaning given to it in Section 5.1(a).

"Step-in Entity Accession Agreement" means the agreement to be entered into by a Step-in Entity pursuant to Section 5.1(d).

"Step-in Notice" has the meaning given to it in Section 5.1(a).

"Step-In Period" means, subject to Article 5, the period from the Step-In Date up to and including the earliest of:

- (1) the Step-Out Date;
- (2) the date of any transfer under Article 5;
- (3) the date of any termination under this Agreement;
- (4) the Expiration Date; and

(5) if the relevant MBTA notice of termination was given before the Full Service Commencement Date, the date that is 6 Months after the Longstop Date.

“**Step-Out Date**” means the date that is 20 Business Days after the date of a Step-Out Notice.

“**Step-Out Notice**” means a notice from the Collateral Agent or the appointed Lenders' Representative to the MBTA pursuant to Section 6.1.

“**Substitute**” has the meaning given to it in Section 7.1.

“**Substitute Accession Agreement**” means the agreement to be entered into by a Substitute pursuant to Section 8.1.

“**Substitution Effective Date**” has the meaning given to it in Section 8.1.

“**Substitution Notice**” has the meaning given to it in Section 7.1.

SECTION 1.2. INTERPRETATION.

This Agreement shall be interpreted according to the following provisions, except to the extent that the context or the express provisions of this Agreement otherwise require.

(1) Plurality. Words importing the singular number mean and include the plural number and vice versa.

(2) Persons. Words importing persons include individuals, legal personal representatives, firms, companies, associations, joint ventures, general partnerships, limited partnerships, limited liability partnerships, limited liability companies, trusts, business trusts, corporations, governmental bodies, and other legal entities.

(3) Headings. The table of contents and any headings preceding the text of the Articles, Sections and subsections of this Agreement shall be solely for convenience of reference and shall not affect its meaning, construction or effect.

(4) References Hereto. The terms “hereby,” “hereof,” “herein,” “hereunder” and any similar terms refer to this Agreement.

(5) References to Days and Time of Day. All references to days herein are references to calendar days, unless otherwise indicated, such as by reference to Business Days. Each reference to time of day is a reference to Eastern Standard time or Eastern Daylight Saving time, as the case may be.

(6) References to Business Days. If the time for doing an act falls or expires on a day that is not a Business Day, the time for doing such act shall be extended to the next Business Day.

(7) References to Including. The words “include”, “includes” and including” are to be construed as meaning “include without limitation”, “includes without limitation” and “including without limitation”, respectively.

(8) References to Statutes. Each reference to a statute or statutory provision includes any statute or statutory provision which amends, extends, consolidates or replaces the statute or statutory provision or which has been amended, extended, consolidated or replaced by the statute

or statutory provision and includes any orders, regulations, by-laws, ordinances, orders, codes of practice or instruments made under the relevant statute.

(9) References to Governmental Bodies. Each reference to a Governmental Body is deemed to include a reference to any successor to such Governmental Body or any organization or entity or organizations or entities which has or have taken over the functions or responsibilities of such Governmental Body.

(10) References to Documents and Standards. Each reference to an agreement, document, standard, principle or other instrument includes (subject to all relevant approvals and any other provision of this Agreement expressly concerning such agreement, document, standard, principle or other instrument) a reference to that agreement, document, standard, principle or instrument as amended, amended and restated, supplemented, substituted, refinanced, replaced, novated or assigned.

(11) References to All Reasonable Efforts. The expression "all reasonable efforts" and expressions of like import, when used in connection with an obligation of the Lenders, the Collateral Agent, any other Lenders' Representative, means taking in good faith and with due diligence all commercially reasonable steps to achieve the objective and to perform the obligation, including doing all that can reasonably be done in the circumstances taking into account each party's obligations hereunder to mitigate delays and additional costs to the other party, and in any event taking no less steps and efforts than those that would be taken by a commercially reasonable and prudent person in comparable circumstances but where the whole of the benefit of the obligation and where all the results of taking such steps and efforts accrued solely to that person's own benefit.

(12) Entire Agreement. This Agreement contains the entire agreement between the parties hereto with respect to the transactions contemplated by this Agreement. Without limiting the generality of the foregoing, this Agreement shall completely and fully supersede all other understandings and agreements among the parties with respect to such transactions.

(13) Counterparts. This Agreement may be executed in any number of original counterparts. All such counterparts shall constitute but one and the same Agreement.

(14) Governing Law. This Agreement shall be governed by and construed in accordance with the applicable laws of the Commonwealth.

(15) Severability. Each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Agreement is held to be invalid, unenforceable or illegal to any extent, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Agreement. If any such provision of this Agreement is held to be invalid, unenforceable or illegal, the parties will promptly endeavor in good faith to negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Agreement as nearly as possible to its original intent and effect.

(16) Drafting Responsibility. The parties waive the application of any rule of law which otherwise would be applicable in connection with the construction of this Agreement that

ambiguous or conflicting terms or provisions should be construed against the party who (or whose counsel) prepared the executed agreement or any earlier draft of the same.

(17) Accounting and Financial Terms. All accounting and financial terms used herein are, unless otherwise indicated, to be interpreted and applied in accordance with generally accepted accounting principles, consistently applied, in the United States.

(18) Consents. Any consent required to be given under this Agreement must be in writing.

SECTION 1.3. ORDER OF PRECEDENCE. In the event of any conflict, ambiguity or inconsistency between the provisions of the Project Agreement and the provisions of this Agreement, the provisions of this Agreement shall prevail.

SECTION 1.4. NO EFFECT ON PROJECT AGREEMENT. Notwithstanding the foregoing Section 1.3, nothing in this Agreement amends or modifies any of the Systems Integrator's obligations under the Project Agreement.

SECTION 1.5. NO GREATER RIGHTS. The Lenders shall not, by virtue of its Funding Agreements or Security Documents, acquire any greater rights to or interest in the Project than the Systems Integrator has at any applicable time under the Project Agreement, other than the provisions in this Agreement for the specific protection of the Lenders. The Lenders shall not have any right to or interest in the Fare Revenues.

ARTICLE 2

CONSENT TO SECURITY

SECTION 2.1. CONSENT. Notwithstanding anything to the contrary in the Project Agreement:

(a) The MBTA acknowledges notice and receipt of, and consents to:

(1) the collateral assignment by the Systems Integrator to the Collateral Agent of any or all of the Systems Integrator's rights, title and interests in, to or under or derived from, the Project Agreement, the Material Contracts, the Subcontracts, the Bonds (to the extent the Systems Integrator is an obligee or beneficiary thereunder), and any rights or interests to or in the Insurance Proceeds, in each case excluding any rights or interests to or in the Handback Reserve Account, the Vandalism Reserve Account, the External Interfaces Reserve and the Unplanned Expansions Reserve, and in each case pursuant to the Financing Documents;

(2) the grant by each of the Equity Members to the Collateral Agent of a security interest in its respective equity interest in the Systems Integrator, in each case pursuant to the Security Documents and Funding Agreements; and

(3) the grant of the security interests in any other collateral set forth in the Financing Documents listed in Attachment 3 hereto.

(b) the granting of the security interests referred to in Section 2.1(a) does not:

(1) constitute (or with the giving of notice or lapse of time, or both, could constitute) either a breach of the Project Agreement, a Remediable Breach or a Systems Integrator Event of Default; or

(2) require any consent of the MBTA that is either additional or supplemental to those granted pursuant to this Section 2.1 as a condition to or requirement for the creation of the liens, pledges and security interests identified in Section 2.1(a).

(c) For so long as any amount of Project Debt is outstanding, the MBTA shall not, without the prior written consent of the Collateral Agent, consent to any assignment, transfer, pledge or hypothecation of the Project Agreement or any interest therein by the Systems Integrator, other than as specified in this Agreement.

SECTION 2.2. MBTA OBLIGATIONS. Except as specifically provided for in this Agreement, the MBTA has no obligations (whether express, implied, collateral or otherwise) to the Collateral Agent or the Lenders in connection with this Agreement, the Project Agreement or the Project. All of the obligations and liabilities given, undertaken or arising on the part of the MBTA under this Agreement are given solely to the Collateral Agent on behalf of the Lenders and do not confer any rights on or in favor of the Systems Integrator or any Affiliate of the Systems Integrator or any other person.

SECTION 2.3. NO NOTICE OF OTHER SECURITY. The MBTA confirms that as of the date of this Agreement, it has not received written notice of any other security interest granted over the Systems Integrator's rights described in Section 2.1(a) other than pursuant to the Financing Documents.

ARTICLE 3

NOTICES

SECTION 3.1. MBTA'S NOTICE.

(a) The MBTA shall provide the Collateral Agent written notice (an "MBTA Notice") promptly upon becoming aware of the following:

- (1) the occurrence of a Systems Integrator Event of Default; or
- (2) the occurrence of a Remediable Breach, or acceptance or non-acceptance of the Systems Integrator's remedial program with respect thereto.

(b) An MBTA Notice shall specify:

- (1) the unperformed obligations of the Systems Integrator under the Project Agreement of which the MBTA is aware (having made reasonable inquiry) and the grounds for termination of the Project Agreement (if applicable) in sufficient detail to enable the Collateral Agent to assess the scope and amount of any liability of the Systems Integrator resulting therefrom;

- (2) all amounts due and payable by the Systems Integrator to the MBTA under the Project Agreement, if any, on or before the date of the MBTA Notice and which remain

unpaid at such date and, by cross-reference to the applicable provision(s) of the Project Agreement, the nature of the Systems Integrator's obligation to pay such amounts; and

(3) the amount of any payments that the MBTA reasonably foresees will become due from the Systems Integrator during the applicable Cure Period.

(c) The MBTA shall update any MBTA Notice issued pursuant to Section 3.1(a) as and when it becomes aware of any unperformed obligations of the Systems Integrator (including non-payment of amounts that have become due) under the Project Agreement that were not specified in the relevant MBTA Notice.

(d) Nothing in this Agreement shall prevent the concurrent running of multiple MBTA Notices.

SECTION 3.2. COLLATERAL AGENT NOTICE. The Collateral Agent shall:

(1) promptly upon becoming aware of any Default Event (whether or not an MBTA Notice has been served in connection with the same event), give the MBTA written notice (a "Collateral Agent Notice");

(2) specify in any Collateral Agent Notice the circumstances and nature of the Default Event to which the Collateral Agent Notice relates; and

(3) notify the MBTA of any decision to accelerate amounts outstanding under the Financing Documents or to exercise any enforcement remedies under the Financing Documents.

SECTION 3.3. MBTA PAYMENTS UNDER THE PROJECT AGREEMENT. The MBTA shall, unless directed otherwise by the Collateral Agent, deposit all amounts payable by it under the Project Agreement into the Designated Account and the Systems Integrator agrees that any payment made in accordance with this Section 3.3 shall constitute a complete discharge of the MBTA's relevant payment obligations under the Project Agreement.

ARTICLE 4

RIGHTS AND OBLIGATIONS DURING THE CURE PERIOD

SECTION 4.1. GENERALLY. During any Cure Period, the MBTA:

(a) Shall not terminate or deliver any notice terminating the Project Agreement, or take any Restricted Action that would have the effect of terminating the Project Agreement prior to the expiration of the Cure Period; provided, however, that until the expiration of such period the MBTA shall be entitled to require the Systems Integrator to remedy any Systems Integrator Event of Default and shall be entitled to exercise all rights under the Project Agreement other than termination of of the Project Agreement or the taking of a Restricted Action;

(b) Shall not take or support any action for the liquidation, bankruptcy, administration, receivership, reorganization, dissolution or winding up of the Systems Integrator or for the composition or readjustment of the Systems Integrator's debts, or any similar insolvency procedure in relation to the Systems Integrator, or for the appointment of a receiver, trustee, custodian, sequestrator, conservator, liquidator, administrator or similar official for the Systems Integrator or for any part of the Systems Integrator's Property; provided, however, that, if and after any of the foregoing have been commenced

with respect to the Systems Integrator by a Person other than the MBTA, this clause shall not restrict or impair the ability of the MBTA to participate in any way in such liquidation, bankruptcy, administration, receivership, reorganization, dissolution or winding up of the Systems Integrator or for the composition or readjustment of the Systems Integrator's debts, or any similar insolvency procedure in relation to the Systems Integrator, or for the appointment of a receiver, trustee, custodian, sequestrator, conservator, liquidator, administrator or similar official for the Systems Integrator or for any part of the Systems Integrator's Property;

(c) Shall not suspend its performance (including in connection with any insolvency or bankruptcy proceeding in relation to the Systems Integrator) under the Project Agreement, unless the grounds for suspension of performance arose during the Cure Period; and

(d) Shall continue to make payments required to be made to the Systems Integrator under the Project Agreement to the Designated Account.

SECTION 4.2. COLLATERAL AGENT'S RIGHT TO CURE A SYSTEMS INTEGRATOR BREACH OR DEFAULT WITHOUT STEP-IN OR TRANSFER. The Collateral Agent shall have the right to take such actions as may be necessary, in the Collateral Agent's discretion, to cure or remedy a Remediabable Breach or Systems Integrator Event of Default prior to any Step-In Period and without the necessity of issuing a Collateral Agent's Step-In Notice. Prior to exercising any such right, the Collateral Agent shall deliver a written notice thereof to the MBTA (a "Collateral Agent Cure Notice"). The MBTA shall have no duty to deal with the Collateral Agent in any such circumstances, but the MBTA will accept performance by the Collateral Agent as performance by the Systems Integrator. Any acts by the Collateral Agent in the exercise of such right shall be deemed to be acts of the Systems Integrator for the purposes of the Project Agreement, including the indemnity provisions thereof. The Collateral Agent may exercise such rights for a period (the "Cure Period") commencing on the date of delivery of a Collateral Agent Notice and ending on the earlier of:

- (1) Any Step-Out Date or Substitution Effective Date;
- (2) The relevant Cure Period Completion Date; or
- (3) The last day of the Term.

ARTICLE 5

STEP-IN

SECTION 5.1. COLLATERAL AGENT'S STEP-IN NOTICE.

(a) If at any time the Collateral Agent proposes that the Collateral Agent, a Lender or any of their respective Affiliates that is not a Restricted Person, or any Person that is a Qualified Substitute Systems Integrator approved by the MBTA in accordance with Section 5.1(b) or 5.1(c), as applicable, to become a joint and several obligor with the Systems Integrator under the Project Agreement and this Agreement in accordance with the terms hereof (any such Collateral Agent, Lender, Affiliate or Person, a "Step-in Entity"), the effectiveness of such arrangement shall be conditional upon:

- (1) The Collateral Agent giving written notice to the MBTA ("Step-in Notice") under this Section 5.1 at any time during any Cure Period or while a Default Event is continuing;

(2) The MBTA's approval (or deemed approval) of the identity of the proposed Step-in Entity pursuant to Section 5.1(b) or Section 5.1(c); and

(3) The proposed Step-in Entity executing a Step-in Entity Accession Agreement in accordance with Section 5.1(d).

(b) The MBTA shall not be entitled to withhold its approval of any proposed Step-in Entity that is the subject of a Step-in Notice unless:

(1) The proposed Step-in Entity is disqualified, suspended or debarred, or subject to a proceeding to suspend or debar it, from bidding, proposing or contracting with any state-level, interstate or federal governmental entity;

(2) The proposed Step-in Entity is prohibited by statute, law or regulation; or

(3) There is any unperformed payment obligations of the Systems Integrator identified in an MBTA Notice that has not been remedied or waived by the MBTA on or before the Step-in Date.

(c) The MBTA shall be deemed to have approved any proposed Step-in Entity that is the subject of a Step-in Notice:

(1) In the case of any entity that is the Collateral Agent, a Lender or any of their respective Affiliates, on the 15th Business Day after the date on which the MBTA received the relevant Step-in Notice if the MBTA has not responded to such notice within such period of time; and

(2) In all other cases, the 30th Business Day after the date on which the MBTA receives the relevant Step-in Notice if the MBTA has not responded to such notice within such period of time.

(d) The Step-in Entity named in the Step-in Notice shall be deemed to become a party to the Project Agreement and this Agreement on and from the date it executes a duly completed Step-in Entity Accession Agreement, substantially in the form attached hereto as Attachment 1 ("Step-in Entity Accession Agreement"), and submits it to the MBTA (the "Step-in Date").

SECTION 5.2. RIGHTS AND OBLIGATIONS ON STEP-IN.

(a) On and from the Step-In Date, the Step-in Entity shall be:

(1) jointly and severally entitled to exercise and enjoy the rights and powers expressed to be assumed by or granted to the Systems Integrator under the Project Agreement and this Agreement;

(2) entitled to exercise and enjoy the rights and powers expressed to be assumed by or granted to a Step-in Entity under this Agreement; and

(3) jointly and severally liable with the Systems Integrator for the payment of all sums due from the Systems Integrator under or arising out of the Project Agreement at the Step-in Date and for the performance of all of the Systems Integrator's obligations under or arising out of the Project Agreement on or after the Step-in Date.

(b) During the Step-in Period, the MBTA undertakes:

(1) not to terminate or give notice terminating the Project Agreement for a Systems Integrator Event of Default, in whole or in part, or take any Restricted Action during the Step-In Period unless the grounds for the termination or giving notice of termination arose during the Step-in Period, in which case the MBTA shall be entitled to terminate the Project Agreement or take any Restricted Action during the Step-In Period by written notice to the Systems Integrator, the Collateral Agent and the Step-in Entity;

(2) not to take or support any action for the liquidation, bankruptcy, administration, receivership, reorganization, dissolution or winding up of the Systems Integrator or for the composition or readjustment of the Systems Integrator's debts, or any similar insolvency procedure in relation to the Systems Integrator, or for the appointment of a receiver, trustee, custodian, sequestrator, conservator, liquidator, administrator or similar official for the Systems Integrator or for any part of the Systems Integrator's Property; provided, however, that, if and after any of the foregoing have been commenced with respect to the Systems Integrator by a Person other than the MBTA, this clause shall not restrict or impair the ability of the MBTA to participate in any way in such liquidation, bankruptcy, administration, receivership, reorganization, dissolution or winding up of the Systems Integrator or for the composition or readjustment of the Systems Integrator's debts, or any similar insolvency procedure in relation to the Systems Integrator, or for the appointment of a receiver, trustee, custodian, sequestrator, conservator, liquidator, administrator or similar official for the Systems Integrator or for any part of the Systems Integrator's Property;

(3) not to suspend its performance (including in connection with any insolvency or bankruptcy proceeding in relation to the Systems Integrator) under the Project Agreement, unless the grounds for suspension of performance arose during the Step-in Period; and

(4) to continue to make payments required to be made to the Systems Integrator under the Project Agreement to the Designated Account.

(c) During the Step-in Period, the MBTA shall owe its obligations under the Project Agreement and this Agreement to the Systems Integrator and such Step-in Entity jointly; provided, however, that:

(1) subject to Section 5.2(c)(2), the performance of such obligations by the MBTA in favor of either such Step-in Entity or the Systems Integrator shall be a good and effective discharge of such obligations under this Agreement and the Project Agreement; and

(2) the Collateral Agent shall be entitled at any time by notice in writing to the MBTA to direct (such direction being binding on the Collateral Agent, the MBTA and the Systems Integrator) that, at all times thereafter while such Step-in Entity is deemed to be a party to the Project Agreement and this Agreement and subject to any further notice from the Collateral Agent, in respect of the rights of the Systems Integrator under the Project Agreement and of the Collateral Agent under this Agreement, such Step-in Entity shall be solely entitled to make any decisions, to give any directions, approvals or consents, to receive any payments or otherwise to deal with the MBTA under the Project Agreement and this Agreement.

(d) The Systems Integrator shall not be relieved from any of its obligations under the Project Agreement, whether arising before or after the Step-in Date, by reason of the Step-in Entity becoming a party to the Project Agreement pursuant to a Step-in Entity Accession Agreement, except to the extent provided in Section 4.2.

ARTICLE 6

STEP-OUT

SECTION 6.1. STEP-OUT NOTICE.

(a) The Collateral Agent or a Step-in Entity may, at any time during the Step-In Period, give written notice ("Step-out Notice") to the MBTA and terminate the Step-In Entity's obligations to the MBTA under the Project Agreement and this Agreement, whereupon the Step-in Entity shall, upon the Step-Out Date, no longer be deemed to be a party to the Project Agreement and this Agreement and, subject to Section 6.1(b), shall be released from all obligations under the Project Agreement and this Agreement. The obligations of the MBTA to the Step-in Entity in such capacity under the Project Agreement and this Agreement shall also terminate upon the Step-Out Date.

(b) Nothing in this Section 6.1 shall have the effect of releasing the Step-in Entity from any liability that relates to the performance or non-performance of the Project Agreement or this Agreement by the Systems Integrator or the Step-in Entity during the Step-in Period.

(c) Nothing in this Section 6.1 shall relieve the Systems Integrator from any of its obligations under the Project Agreement.

ARTICLE 7

SUBSTITUTION NOTICE

SECTION 7.1. NOTICE OF SUBSTITUTE. To the extent that during a Cure Period, during the occurrence and continuance of a Systems Integrator Event of Default or a Default Event (in the case of a Systems Integrator Event of Default only, for so long as the Cure Period has not expired), or during the Step-In Period, the Collateral Agent or the Lenders at any time propose to require the Systems Integrator to assign its rights and obligations under the Project Agreement or this Agreement to a Person (a "Substitute") designated by the Collateral Agent (whether by mutual agreement or enforcement of rights under the Financing Documents) that meets the requirements of a Qualified Substitute Systems Integrator, the effectiveness of such assignment shall be conditional upon:

(a) the Collateral Agent issuing a notice (a "Substitution Notice") to the MBTA designating the Substitute;

(b) the proposed Substitute executing a Substitute Accession Agreement in accordance with Section 8.1; and

(c) the MBTA approving the identity of the proposed Substitute pursuant to Section 7.2 to the extent required thereunder.

SECTION 7.2. GROUND FOR REFUSING APPROVAL. The MBTA shall only be entitled to withhold its approval to any proposed Substitute that is the subject of a Substitution Notice if:

- (a) the proposed Substitute is not a Qualified Substitute Systems Integrator; or
- (b) subject to Section 8.4, there are outstanding breaches of the Project Agreement that have been previously notified by the MBTA to the Collateral Agent that either:
- (1) have not, to the reasonable satisfaction of the MBTA, been remedied or waived prior to the 30th day after the date on which the MBTA receives the information required pursuant to Section 7.3; or
 - (2) if not so remedied or waived, are not the subject of a plan approved by the MBTA (such approval not to be unreasonably withheld or delayed) specifying: (A) subject to Section 7.2(b)(2)(B), the remedial action that the Substitute will be required to take after the Substitution Effective Date in order to remedy each such breach; and (B) with respect to any such breach that is incapable of being cured by the proposed Substitute, the action(s) the Substitute will be required to take after the Substitution Effective Date in order to prevent such breach (if capable of repetition) from occurring in the future.

SECTION 7.3. PROVISION OF INFORMATION. The Collateral Agent shall, as soon as practicable, provide to the MBTA such information in relation to the proposed Substitute and any Person who, it is proposed, will enter into a material subcontract with the proposed Substitute in relation to the Project, as the MBTA shall reasonably require to enable it to reasonably determine whether the proposed Substitute is a Qualified Substitute Systems Integrator, including:

- (a) the name and address of the proposed Substitute;
- (b) unless such proposed Substitute is a publicly traded entity, the names of the proposed Substitute's shareholders or members and the share capital or partnership or membership interests, as the case may be, held by each of them;
- (c) the manner in which it is proposed to finance the proposed Substitute and the extent to which such financing is committed (to the extent relevant);
- (d) copies of the proposed Substitute's most recent financial statements (and if available, such financial statements shall be for the last three financial years and audited), or in the case of a special purpose company, its opening balance sheet;
- (e) a copy of the proposed Substitute's organizational documents;
- (f) details of the resources available to the proposed Substitute and the proposed Substitute's appropriate qualifications, experience and technical competence available to the proposed Substitute to enable it to perform the obligations of the Systems Integrator under the Project Agreement; and
- (g) the names of the proposed Substitute's directors and any key personnel who will have responsibility for the day-to-day management of its participation in the Project.

SECTION 7.4. DEEMED APPROVAL. If the MBTA has failed to respond to the Collateral Agent within 30 days of the date on which the MBTA has confirmed it has received the information specified in Section 7.3 in respect of any proposed Substitute, the approval of the MBTA shall be deemed to have been given.

ARTICLE 8

SUBSTITUTION

SECTION 8.1. SUBSTITUTION EFFECTIVE DATE. If the MBTA approves (or is deemed to have approved) the identity of a proposed Substitute pursuant to Article 7, the Substitute shall execute a duly completed Substitute Accession Agreement substantially in the form set out in Attachment 2 to this Agreement and submit it to the MBTA (with a copy of it to the other parties to this Agreement). Such assignment shall become effective on and from the date on which the MBTA countersigns the Substitute Accession Agreement or the date that is 10 days after the date the MBTA receives the completed Substitute Accession Agreement if the MBTA fails to countersign the Substitute Accession Agreement (the "Substitution Effective Date").

SECTION 8.2. EFFECTIVENESS OF SUBSTITUTION. On and from the Substitution Effective Date:

(a) such Substitute shall become a party to the Project Agreement and this Agreement in place of the Systems Integrator who shall be immediately released from its obligations arising under, and cease to be a party to, the Project Agreement and this Agreement from that Substitution Effective Date; and

(b) such Substitute shall exercise and enjoy the rights, perform the obligations and have the liabilities of the Systems Integrator under the Project Agreement and this Agreement, including any and all undischarged obligations (including any undischarged liability in respect of any loss or damage suffered or incurred by the Systems Integrator prior to the Substitution Effective Date) of the Systems Integrator and any Substitute Entity that were otherwise required to be performed by the Systems Integrator prior to the Substitution Effective Date; and

(c) the MBTA shall owe its obligations (including any undischarged liability in respect of any loss or damage suffered or incurred by the Systems Integrator or any Substitute Entity prior to the Substitution Effective Date) under the Project Agreement and this Agreement to such Substitute in place of the Systems Integrator and any Step-in Entity.

SECTION 8.3. FACILITATION OF TRANSFER. The MBTA shall use its reasonable efforts to facilitate the transfer to the Substitute of the Systems Integrator's obligations under the Project Agreement and this Agreement.

SECTION 8.4. SETTLEMENT OF OUTSTANDING FINANCIAL LIABILITIES.

(a) The Substitute shall pay to the MBTA within 30 days after the Substitution Effective Date any amount due from the Systems Integrator to the MBTA under the Project Agreement and this Agreement as of the Substitution Effective Date (as notified by the MBTA to the Substitute reasonably in advance of such Substitution Effective Date).

(b) If the Substitute fails to satisfy its obligations pursuant to Section 8.4(a), the MBTA shall be entitled to exercise its rights under the Project Agreement in respect of the amount so due and unpaid.

SECTION 8.5. CONSEQUENCES OF SUBSTITUTION. On and from the Substitution Effective Date:

(a) subject to Section 8.4, any right of termination or any other right suspended by virtue of Section 5.1 shall be of no further effect and the MBTA, without limiting any right of the MBTA or

obligation of the Substitute in respect of any remedial plan approved by the MBTA pursuant to Section 7.2(b), shall not be entitled to terminate the Project Agreement or this Agreement by virtue of any act, omission or circumstance that occurred prior to such Substitution Effective Date;

(b) if any Step-in Entity is a party to or has any obligations under the Project Agreement and this Agreement on the Substitution Effective Date, such Step-in Entity shall cease to be a party thereto and hereto and shall be discharged from all obligations thereunder and hereunder; and

(c) the MBTA, the Collateral Agent and the Substitute (replacing the Systems Integrator as a party) shall enter into an equivalent direct agreement on substantially the same terms as this Agreement.

ARTICLE 9

REINSTATEMENT OF REMEDIES

If an MBTA Notice has been given, the grounds for that notice are continuing and have not been remedied or waived by the MBTA and:

(a) no Step-in Entity or Substitute becomes a party to the Project Agreement and this Agreement before the Cure Period Completion Date relating thereto; or

(b) a Step-in Entity becomes a party to the Project Agreement and this Agreement, but the Step-in Period relating to such Step-in Entity ends without a Substitute becoming a party thereto and hereto,

then, on and from the Cure Period Completion Date or the date such Step-in Period expires, the MBTA shall be entitled to:

(1) act upon any and all grounds for termination available to it in relation to the Project Agreement in respect of the Systems Integrator Events of Default under the Project Agreement that have not been remedied or waived by the MBTA;

(2) pursue any and all claims and exercise any and all remedies against the Systems Integrator; and

(3) if and to the extent that it is then entitled to do so under the Project Agreement, take or pursue any action of the type referred to in Section 4.1.

ARTICLE 10

IMPACT OF BANKRUPTCY OR INSOLVENCY PROCEEDINGS

SECTION 10.1. REJECTION OF THE PROJECT AGREEMENT.

(a) If the Project Agreement is rejected by a trustee or debtor-in-possession in, or terminated as a result of, any bankruptcy or insolvency proceeding involving the Systems Integrator and, within 150 days after such rejection or termination, the Collateral Agent shall so request and shall certify in writing to the MBTA that the Collateral Agent or the Collateral Agent's permitted designee or assignee, including a Qualified Substitute Systems Integrator, intends to perform the obligations of the Systems Integrator as

and to the extent required under the Project Agreement, the MBTA will execute and deliver to the Collateral Agent (or any Substitute satisfying the requirements of this Agreement if directed to do so by the Collateral Agent) a new project agreement. The new project agreement shall contain conditions, agreements, terms, provisions and limitations which are substantially the same as those of the Project Agreement. References in this Agreement to the "Project Agreement" shall be deemed also to refer to any such new project agreement as executed.

(b) The effectiveness of any new project agreement referred to in Section 10.1(a) above will be conditional upon the Collateral Agent first reimbursing the MBTA in respect of all of its costs and expenses, including legal fees and expenses, incurred in connection with the execution and delivery of such new project agreement.

SECTION 10.2. EXTENSION OF CURE PERIOD COMPLETION DATE. To the extent that the Collateral Agent is prohibited by any court order, bankruptcy or insolvency proceedings from (a) remedying the Systems Integrator Event of Default that is the subject of an MBTA Notice; or (b) from commencing or prosecuting foreclosure proceedings, the Cure Period Completion Date shall be extended by a period of time equal to the period of such prohibition. However, if the relevant proceedings or other similar proceedings were commenced by the Collateral Agent acting on behalf of the Lenders, such period shall instead be the shorter of the period of:

- (a) Such prohibition or inability; and
- (b) 270 days.

ARTICLE 11

TERMINATION OF THIS AGREEMENT

This Agreement shall remain in effect until the earliest to occur of:

- (a) The date on which all of the obligations of the Systems Integrator under the Financing Documents have been irrevocably discharged in full to the satisfaction of the Collateral Agent;
- (b) the time at which all of the parties' respective obligations and liabilities under the Project Agreement and this Agreement have expired or have been satisfied in accordance with the terms of the Project Agreement and this Agreement; and
- (c) any assignment to a Substitute has occurred under Article 8 and the MBTA shall have entered into an equivalent agreement on substantially the same terms as this Agreement, except that the Systems Integrator has been replaced as a party by the Substitute.

ARTICLE 12

PRESERVATION OF FUNDS

Notwithstanding the other provisions of this Agreement and the terms and conditions of the Financing Documents, the Collateral Agent agrees for itself and on behalf of the Lenders that it shall not exercise any rights under the Financing Documents or take any other steps that would prejudice the operation of Section 8.2, Section 8.4 and Section 11.4 of the Project Agreement.

ARTICLE 13

COMPETING STEP-IN RIGHTS

SECTION 13.1. SUBORDINATION OF MBTA RIGHTS. Notwithstanding any provision in any Material Contract Direct Agreement to the contrary and without limiting any of the MBTA's rights under Section 5.10 or Section 21.6 of the Project Agreement, the MBTA agrees that it will not exercise any rights of step-in, novation or other similar rights it may have under such Material Contract Direct Agreement until:

(a) the Project Agreement has been terminated (other than pursuant to a transfer to a Substitute pursuant to Article 8); or

(b) the expiry of any relevant period under such Material Contract Direct Agreement in which the Collateral Agent is required or entitled to either exercise or procure the exercise of rights of step-in, novation, transfer or any similar right under such Material Contract Direct Agreement; or

(c) if the Collateral Agent has exercised or procured the exercise of rights of step-in, novation, transfer or any similar right, the date of any step-out or similar event (howsoever defined) under such Material Contract Direct Agreement has occurred.

SECTION 13.2. FORBEARANCE. To the extent the MBTA has rights to enforce any of the Project Contracts, whether as an assignee of the Systems Integrator's rights or otherwise, so long as the Project Agreement remains in effect the MBTA shall forebear from exercising remedies against the Project Contractor if (a) the Systems Integrator or the Collateral Agent commences the good faith, diligent exercise of remedies available to the Systems Integrator under the Project Contract within 15 days after the MBTA delivers written notice to the Systems Integrator and the Collateral Agent of default by the Project Contractor, and (b) thereafter continues such good faith, diligent exercise of remedies until the default is cured. At the MBTA's request from time to time, the Systems Integrator or the Collateral Agent shall provide to the MBTA reports on the status of any such default, cure and exercise of remedies.

SECTION 13.3. EXPIRY OF LENDER RIGHTS. The Collateral Agent shall notify the MBTA:

(a) promptly, and in any event, within five Business Days of the date on which the Collateral Agent (or any trustee or administrator acting on behalf of the Lenders) or the Systems Integrator have exhausted all of their direct or indirect legal rights and remedies against the Project Contractor under the Project Contract or have determined not to exercise (or to cease exercising) or are not entitled to exercise the same; and

(b) of any decision by the Lenders whether or not to exercise any or all of their direct or indirect rights against the Project Contractor under the Financing Documents or the Project Contract (if they have not by then given notice under (a) above) by the date six months after the date that the MBTA pays to the Systems Integrator the whole of the termination compensation (if any) that is payable to the Systems Integrator following termination of the Project Agreement; and

(c) following receipt by the MBTA of such notice, all of the right, title and interest of the Collateral Agent or any other Lender against the Project Contractor pursuant to the Financing

Documents shall be subject and subordinated in all respects to all right, title and interest of the MBTA pursuant to the Material Contract Direct Agreement.

ARTICLE 14

ASSIGNMENT

SECTION 14.1. RESTRICTION ON ASSIGNMENT. No party to this Agreement may assign or transfer all or any part of its rights or obligations under this Agreement (except to another Governmental Body to which all or substantially all of the revenues, assets and liabilities constituting the MBTA enterprise are transferred) without the prior written consent of the other parties, except as provided in this Article.

SECTION 14.2. ASSIGNMENT BY COLLATERAL AGENT. The Collateral Agent may assign or transfer its rights and obligations under this Agreement to a successor Collateral Agent in accordance with the Financing Documents without the consent of the MBTA, provided that the Collateral Agent delivers to the MBTA not less than 10 Business Days prior to such assignment a notice setting out such contact information regarding the assignee as the MBTA may reasonably require and provided the assignee or transferee is not a Restricted Person.

SECTION 14.3. NEW AGREEMENT. If Section 14.2 applies in relation to the Collateral Agent, the MBTA and the Systems Integrator shall, upon request by the new Collateral Agent, enter into a new lenders' remedies agreement with the new Collateral Agent on substantially the same terms as this Agreement.

SECTION 14.4. SUCCESSORS AND ASSIGNS. This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors and permitted assigns.

ARTICLE 15

GENERAL

SECTION 15.1. REPRESENTATIONS AND WARRANTIES.

(a) The undersigned signatory for the Collateral Agent hereby represents and warrants that he or she is an officer of the Collateral Agent and that he or she has full and complete authority to enter into this Agreement on behalf of the Collateral Agent.

(b) The Collateral Agent hereby represents and warrants that the Collateral Agent has full power, right and authority to execute and perform each and all of its obligations under this Agreement. These representations and warranties are made for the purpose of inducing the MBTA and the Systems Integrator to enter into this Agreement.

(c) The undersigned signatory for the Systems Integrator hereby represents and warrants that he or she is an officer of the Systems Integrator and that he or she has full and complete authority to enter into this Agreement on behalf of the Systems Integrator.

(d) The Systems Integrator hereby represents and warrants that the Systems Integrator has full power, right and authority to execute and perform each and all of its obligations under this Agreement. These representations and warranties are made for the purpose of inducing the MBTA and the Collateral Agent to enter into this Agreement.

(e) The undersigned signatory for the MBTA hereby represents and warrants that he or she is an officer of the MBTA and has full and complete authority to enter into this Agreement on behalf of the MBTA.

(f) The MBTA has full power, right and authority to execute and perform each and all of its obligations under this Agreement, the Project Agreement and the DB Contract. These representations and warranties are made for the purpose of inducing the Collateral Agent to enter into this Agreement.

(g) The MBTA represents and warrants to the Collateral Agent that this Agreement constitutes a legal, valid and binding obligation of the MBTA enforceable against the MBTA in accordance with its terms, except as such enforceability may be limited by (i) applicable bankruptcy, insolvency, reorganization, moratorium or other similar laws affecting the enforcement of creditors' rights generally and (ii) general principles of equity (regardless of whether such enforceability is considered in a proceeding in equity or at law).

(h) The MBTA represents and warrants to the Collateral Agent that there is no Systems Integrator Event of Default, there exists no event or condition that would, with the giving of notice or passage of time or both, constitute, to its knowledge, a Systems Integrator Event of Default, and, to its knowledge, no Systems Integrator Event of Default has occurred prior to the date hereof.

SECTION 15.2. NO MBTA OR COMMONWEALTH RESPONSIBILITY FOR PROJECT DEBT. None of the Commonwealth, the MBTA, or any other agency, instrumentality or political subdivision of the Commonwealth, and no board member, director, officer, employee, Collateral Agent or representative of any of them, shall have any liability whatsoever for payment of the principal sum of any Project Debt, any other obligations issued or incurred by the Systems Integrator in connection with the Project Agreement or the Project, or any interest accrued thereon or any other sum secured by or accruing under the Financing Documents. Except for a violation by the MBTA of its express obligations to Lenders set forth in this Agreement, no Lender shall be entitled to seek any damages or other amounts from the MBTA, whether for Project Debt or any other obligation amount. The MBTA's review of the Financing Documents is not a guarantee or endorsement of the Project Debt, any other obligations issued or incurred by the Systems Integrator in connection with this Project Agreement or the Project, and is not a representation, warranty or other assurance as to the ability of the Systems Integrator to perform its obligations with respect to the Project Debt or any other obligations issued or incurred by the Systems Integrator in connection with the Project Agreement or the Project, or as to the adequacy of the Availability Payment to provide for payment of the Project Debt or any other obligations issued or incurred by the Systems Integrator in connection with the Project Agreement or the Project, except that the foregoing does not affect any of MBTA's liability to the Systems Integrator under Article 23 of the Project Agreement and any termination payment that is measured in whole or in part by outstanding Project Debt.

SECTION 15.3. COLLATERAL AGENT LIABILITY.

(a) Notwithstanding anything to the contrary in this Agreement, but subject to Article 5 (but solely to the extent the Collateral Agent or any of its Affiliates is the Step-In Entity), Section 3.2 and Section 15.1, the Collateral Agent shall not have any liability to the MBTA under this Agreement, unless:

- (1) the Collateral Agent expressly assumes such liability in writing; or

(2) such liability arises as a result of or is made in response to any breach of law or fraud, willful misconduct, criminal conduct, bad faith or gross negligence by or of the Collateral Agent.

(b) The MBTA acknowledges and agrees that the Collateral Agent shall not be obligated or required to perform any of the System Integrator's obligations under the Project Agreement, except during any Step-in Period and then solely to the extent the Collateral Agent or any of its Affiliates is the Step-In Entity.

SECTION 15.4. SEVERABILITY. In the event any one or more of the provisions contained in this Agreement shall, for any reason, be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof and this Agreement shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

SECTION 15.5. ENTIRE AGREEMENT. Unless otherwise stated in this Agreement, this Agreement constitutes the entire agreement between the parties in connection with its subject matter and supersedes all prior representations, communications, negotiations and understandings concerning the subject matter of this Agreement. No party has relied on any representation except as expressly set forth in this Agreement.

SECTION 15.6. VENUE. For the purposes of any legal actions or proceedings brought by any party hereto against the other party, the parties hereby irrevocably submit to the exclusive jurisdiction of the courts of the Commonwealth of Massachusetts and acknowledge their competence and the convenience and propriety of the venue and agree to be bound by any judgment thereof and not to seek, and hereby waive, review of its merits by the courts of any other jurisdiction.

SECTION 15.7. WAIVER.

(a) No amendment of this Agreement, and no waiver of any term, covenant or condition of this Agreement, shall be effective unless in writing and signed by the parties to this Agreement.

(b) The exercise by a party of any right or remedy provided under this Agreement or law shall not waive or preclude any other or further exercise thereof or the exercise of any other right or remedy. No waiver by any party of any right or remedy under this Agreement or law shall be deemed to be a waiver of any other or subsequent right or remedy under this Agreement or law. The consent by one party to any act by the other party requiring such consent shall not be deemed to render unnecessary the obtaining of consent to any subsequent act for which consent is required, regardless of whether similar to the act for which consent is given.

SECTION 15.8. PRIOR CONTRACTS SUPERSEDED. This Agreement constitutes the sole agreement of the parties hereto with respect to the subject matter set forth herein and supersedes any prior understandings or written or oral contracts between the parties respecting such subject matter.

SECTION 15.9. COUNTERPARTS. This Agreement may be executed in any number of counterparts, each of which will be deemed an original, but all of which when taken together will constitute one and the same instrument. Delivery of an executed counterpart of a signature page of this Agreement by facsimile or other electronic means using electronic signatures shall be as effective as delivery of a manually executed counterpart of this Agreement.

SECTION 15.10. NO PARTNERSHIP. Nothing contained in this Agreement shall be deemed to constitute a partnership between the parties hereto.

SECTION 15.11. NO THIRD-PARTY BENEFICIARIES. Nothing contained in this Agreement is intended or will be construed as creating or conferring any rights, benefits or remedies upon, or creating any obligations of the parties hereto toward, any person or entity not a party to this Agreement.

SECTION 15.12. DISPUTES.

(a) In the event of any dispute between the MBTA and the Collateral Agent under this Agreement, the parties shall resolve the dispute according to the dispute resolution procedures set forth in the Project Agreement, with the Collateral Agent having the same rights and obligations as the Systems Integrator under the dispute resolution procedures set forth in Article 20 of the Project Agreement.

(b) Nothing in Section 15.12(a) affects the Collateral Agent's rights and remedies against the Systems Integrator and the Systems Integrator's Interest under the Financing Documents or the procedures available to the Collateral Agent under law to exercise its security interests thereunder.

SECTION 15.13. NO INTERFERENCE. The Systems Integrator joins in this Agreement to acknowledge and consent to the arrangements set out and agrees not to knowingly do or omit to do anything that may prevent any party from enforcing its rights under this Agreement.

SECTION 15.14. EFFECT OF BREACH. Without prejudice to any rights a party may otherwise have, a breach of this Agreement shall not of itself give rise to a right to terminate the Project Agreement.

SECTION 15.15. CONFIDENTIALITY. The MBTA and the Collateral Agent will, for each other's benefit, comply with the requirements of the Project Agreement with regard to the public disclosure of information as if any reference to the Systems Integrator therein was a reference to the Collateral Agent.

SECTION 15.16. NOTICES. Whenever under the provisions of this Agreement it will be necessary or desirable for one party to serve any approval, notice, request, demand, report or other communication on another party, all notices and other communications provided for hereunder or thereunder shall be given or made in writing (including, without limitation, by facsimile or other electronic transmission) delivered to the intended recipient at the address specified below or, as to any party, at such other address as shall be designated by such party in a notice to each other party. Except as otherwise provided in this Agreement, all such communications shall be deemed to have been duly given when transmitted by facsimile or other electronic transmission or personally delivered or, in the case of a mailed notice, upon receipt, in each case given or addressed as aforesaid. Any notice or other communication delivered by email to the Collateral Agent must be contained in a scanned or imaged attachment (such as .pdf or similar widely used format).

if to the MBTA:

with a copy to:

if to the Collateral Agent:

with a copy to:

if to the Systems Integrator:

with a copy to:

or to such other address as any party may, from time to time, designate in the manner set forth above.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives on the day and year first above written.

[SIGNATURE PAGE TO BE DEVELOPED.]

ATTACHMENT 1

STEP-IN ENTITY ACCESSION AGREEMENT

[Date]

To: The Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, Massachusetts 02116
Copied to: [To be provided.]
From: [Step-in Entity]

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES PROJECT

STEP-IN ENTITY ACCESSION AGREEMENT

Ladies and Gentlemen:

Reference is made to the Project Agreement, dated as of [___] (as amended, amended and restated, supplemented or otherwise modified from time to time, the "Project Agreement"), between the Massachusetts Bay Transportation Authority (the "MBTA") and [Name of Systems Integrator] (the "Systems Integrator") and the Lenders' Remedies Agreement, dated as of [___] (as amended, amended and restated, supplemented or otherwise modified from time to time, the "Lenders' Remedies Agreement"), by and between the Systems Integrator, the MBTA and [Collateral Agent], as Collateral Agent.

Capitalized terms not otherwise defined herein will have the same meaning given to them in the Lenders' Remedies Agreement.

1. We hereby confirm that we are a Step-in Entity pursuant to Article 5 of the Lenders' Remedies Agreement.
2. We acknowledge and agree that, upon and by reason of our execution of this Step-in Entity Accession Agreement, we will become a party to the Project Agreement and the Lenders' Remedies Agreement as a Step-in Entity and, accordingly, shall have the rights and powers and assume the obligations of the Systems Integrator under the Project Agreement and the Lenders' Remedies Agreement in accordance with the terms of the Lenders' Remedies Agreement.
3. Our address, fax and telephone number, and address for electronic mail for the purpose of receiving notices are as follows:
[Contact details of Step-in Entity]
4. This Step-in Entity Accession Agreement shall be governed by, and construed in accordance with, the law of the Commonwealth of Massachusetts. Venue for any legal action arising out of this Agreement shall lie in any Massachusetts state court or U.S. federal court sitting in Boston, Massachusetts.

The terms set forth herein are hereby agreed to:

[*Step-in Entity*]

By: _____

Name: _____

Title: _____

Agreed for and on behalf of the Massachusetts Bay Transportation Authority:

By: _____

Name: _____

Title: _____

ATTACHMENT 2

SUBSTITUTE ACCESSION AGREEMENT

[Date]

To: The Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, Massachusetts 02116
Copied to: [To be provided.]
From: [Substitute]

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES PROJECT

SUBSTITUTE ACCESSION AGREEMENT

Ladies and Gentlemen:

Reference is made to the Project Agreement, dated as of [___] (as amended, amended and restated, supplemented or otherwise modified from time to time, the "Project Agreement"), between the Massachusetts Bay Transportation Authority (the "MBTA") and [Name of Systems Integrator] (the "Systems Integrator") and the Lenders' Remedies Agreement, dated as of [___] (as amended, amended and restated, supplemented or otherwise modified from time to time, the "Lenders' Remedies Agreement"), by and between the Systems Integrator, the MBTA and [Collateral Agent], as Collateral Agent.

Capitalized terms not otherwise defined herein will have the same meaning given to them in the Lenders' Remedies Agreement.

1. We hereby confirm that we are a Substitute pursuant to Article 8 of the Lenders' Remedies Agreement.
2. We acknowledge and agree that, upon and by reason of our execution of this Substitute Accession Agreement, we will become a party to the Project Agreement and the Lenders' Remedies Agreement as a Substitute and, accordingly, shall have the rights and powers and assume the obligations of the Systems Integrator under the Project Agreement and the Lenders' Remedies Agreement in accordance with the terms of the Lenders' Remedies Agreement.
3. Our address, fax and telephone number, and address for electronic mail for the purpose of receiving notices are as follows:
[Contact details of Substitute]
4. This Substitute Accession Agreement shall be governed by, and construed in accordance with, the law of the Commonwealth of Massachusetts. Venue for any legal action arising out of this Agreement shall lie in any Massachusetts state court or U.S. federal court sitting in Boston, Massachusetts.

The terms set forth herein are hereby agreed to:

[*Substitute*]

By: _____

Name: _____

Title: _____

Agreed for and on behalf of the Massachusetts Bay Transportation Authority:

By: _____

Name: _____

Title: _____

ATTACHMENT 3
FINANCING DOCUMENTS

Funding Agreements
[To be inserted.]

Security Documents
[To be inserted.]

MATERIAL CONTRACT DIRECT AGREEMENT

FOR AUTOMATED FARE COLLECTION SYSTEM SERVICES

between

THE MASSACHUSSETS BAY TRANSPORTATION AUTHORITY

and

[MATERIAL CONTRACT PARTY]

and

[GUARANTOR]

and

[SYSTEMS INTEGRATOR]

[_____, 20__]

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TABLE OF CONTENTS

Page

ARTICLE 1

DEFINITIONS AND INTERPRETATION

SECTION 1.1. DEFINITIONS.....2
SECTION 1.2. INTERPRETATION.....2

ARTICLE 2

SIGNATORY WARRANTY

SECTION 2.1. MATERIAL CONTRACT PARTY5
SECTION 2.2. GUARANTOR5
SECTION 2.3. SYSTEMS INTEGRATOR.....5
SECTION 2.4. MBTA5

ARTICLE 3

WARRANTY AND LIABILITY

SECTION 3.1. MATERIAL CONTRACT PARTY’S WARRANTY AND LIABILITY6

ARTICLE 4

STEP-IN RIGHTS IN FAVOR OF THE MBTA

SECTION 4.1. MBTA STEP-IN RIGHTS.....7
SECTION 4.2. PROJECT AGREEMENT TERMINATION COVENANTS8
SECTION 4.3. NOTICE OF PROJECT AGREEMENT TERMINATION8
SECTION 4.4. MBTA OBLIGATIONS TO MATERIAL CONTRACT PARTY8
SECTION 4.5. INCIDENTS8
SECTION 4.6. EMERGENCIES.....9

ARTICLE 5

ASSIGNMENT

SECTION 5.1. RESTRICTION ON ASSIGNMENT10
SECTION 5.2. ASSIGNMENT BY MATERIAL CONTRACT PARTY OR
GUARANTOR10
SECTION 5.3. ASSIGNMENT BY SYSTEMS INTEGRATOR.....10
SECTION 5.4. ASSIGNMENT BY MBTA.....10

TABLE OF CONTENTS
(continued)

Page

ARTICLE 6

GENERAL

| | |
|---|----|
| SECTION 6.1. TERM | 11 |
| SECTION 6.2. DISPUTES | 11 |
| SECTION 6.3. CONFLICT OR INCONSISTENCY..... | 11 |
| SECTION 6.4. VENUE | 11 |
| SECTION 6.5. WAIVER..... | 11 |
| SECTION 6.6. CONFIDENTIALITY | 11 |
| SECTION 6.7. BINDING EFFECT | 11 |
| SECTION 6.8. NOTICES..... | 11 |

MATERIAL CONTRACT DIRECT AGREEMENT

THIS MATERIAL CONTRACT DIRECT AGREEMENT (“**Agreement**”) is made and entered into as of _____, 2017, between the Massachusetts Bay Transportation Authority, a body politic and corporate and a political subdivision of the Commonwealth of Massachusetts (the “**MBTA**”), [MATERIAL CONTRACT PARTY], a _____ organized and existing under the laws of _____ (the “**Material Contract Party**”), [GUARANTOR], a _____ organized and existing under the laws of _____ (the “**Guarantor**”), and [SYSTEMS INTEGRATOR], a _____, organized and existing under the laws of _____ (the “**Systems Integrator**”).

RECITALS

WHEREAS, the MBTA is a political subdivision of the Commonwealth of Massachusetts (the “**Commonwealth**”), established under the provisions of M.G.L. c. 161A (the “**Act**”), and is responsible for providing public transportation services in certain areas of the Commonwealth; and

WHEREAS, the MBTA has determined to implement a new automated, account-based open fare collection system (the “**System**”) to serve the MBTA’s transportation network, with the capability of expansion to other transportation agencies, modes and services in order to make public transportation services a seamless network as viewed by travelers in the region;

WHEREAS, the MBTA and the Systems Integrator have entered into a Project Agreement, dated [_____] (the “**Project Agreement**”), in connection with the design, implementation, installation, integration, testing, financing, operation and maintenance of the System, as more fully described in the Project Agreement;

WHEREAS, through a [_____] contract, dated [_____] (the “**Material Contract**”), the Systems Integrator has retained the Material Contract Party to carry out [_____] in relation to the System.

WHEREAS, by a parent guaranty (the “**Guaranty Agreement**”), the Guarantor has guaranteed the obligations of the Material Contract Party under the Material Contract.

WHEREAS, delivery of this Agreement is a condition precedent to Financial Close under the Project Agreement.

In consideration of the mutual promises and agreements of the parties herein expressed and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto covenant and agree as follows:

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ARTICLE 1

DEFINITIONS AND INTERPRETATION

SECTION 1.1. DEFINITIONS. Unless otherwise specified or the context otherwise requires, capitalized but otherwise undefined terms in this Agreement shall have the respective meanings given to such terms in the Project Agreement, and.

“**Default Notice**” has the meaning specified in subsection 4.1(A).

“**Material Contract Party Security**” means any payment or performance security provided by the Material Contract Party in favor of the Systems Integrator in accordance with Article 19 of the Project Agreement.

“**MBTA Step-in**” has the meaning specified in subsection 4.1(D).

“**MBTA Step-in Notice**” has the meaning specified in subsection 4.1(C).

“**MBTA Step-in Rights Period**” has the meaning specified in subsection 4.1(C).

SECTION 1.2. INTERPRETATION. This Agreement shall be interpreted according to the following provisions, except to the extent that the context or the express provisions of this Agreement otherwise require.

(1) Plurality. Words importing the singular number mean and include the plural number and vice versa.

(2) Persons. Words importing persons include individuals, legal personal representatives, firms, companies, associations, joint ventures, general partnerships, limited partnerships, limited liability partnerships, limited liability companies, trusts, business trusts, corporations, governmental bodies, and other legal entities.

(3) Headings. The table of contents and any headings preceding the text of the Articles, Sections and subsections of this Agreement shall be solely for convenience of reference and shall not affect its meaning, construction or effect.

(4) References Hereto. The terms “hereby,” “hereof,” “herein,” “hereunder” and any similar terms refer to this Agreement.

(5) References to Days and Time of Day. All references to days herein are references to calendar days, unless otherwise indicated, such as by reference to Business Days. Each reference to time of day is a reference to Eastern Standard time or Eastern Daylight Saving time, as the case may be.

(6) References to Business Days. If the time for doing an act falls or expires on a day that is not a Business Day, the time for doing such act shall be extended to the next Business Day.

(7) References to Including. The words “include”, “includes” and including” are to be construed as meaning “include without limitation”, “includes without limitation” and “including without limitation”, respectively.

(8) References to Statutes. Each reference to a statute or statutory provision includes any statute or statutory provision which amends, extends, consolidates or replaces the statute or statutory provision or which has been amended, extended, consolidated or replaced by the statute or statutory provision and includes any orders, regulations, by-laws, ordinances, orders, codes of practice or instruments made under the relevant statute.

(9) References to Governmental Bodies. Each reference to a Governmental Body is deemed to include a reference to any successor to such Governmental Body or any organization or entity or organizations or entities which has or have taken over the functions or responsibilities of such Governmental Body.

(10) References to Documents and Standards. Each reference to an agreement, document, standard, principle or other instrument includes (subject to all relevant approvals and any other provision of this Agreement expressly concerning such agreement, document, standard, principle or other instrument) a reference to that agreement, document, standard, principle or instrument as amended, supplemented, substituted, novated or assigned.

(11) References to Dollar Amounts. All statements of, or references to, dollar amounts or money, including references to “\$” and “dollars”, are to the lawful currency of the United States of America.

(12) References to All Reasonable Efforts. The expression “all reasonable efforts” and expressions of like import, when used in connection with an obligation of a party hereto, means taking in good faith and with due diligence all commercially reasonable steps to achieve the objective and to perform the obligation, including doing all that can reasonably be done in the circumstances taking into account each party’s obligations hereunder to mitigate delays and additional costs to the other party, and in any event taking no less steps and efforts than those that would be taken by a commercially reasonable and prudent person in comparable circumstances but where the whole of the benefit of the obligation and where all the results of taking such steps and efforts accrued solely to that person’s own benefit.

(13) Discretion. When a party hereto has “discretion”, it means that the party has the sole, absolute and unfettered discretion, with no requirement to act reasonably or provide reasons unless specifically required under the provisions of this Agreement.

(14) References to Promptly. The word “promptly” is to be construed as meaning as soon as reasonably practicable in light of then-prevailing circumstances.

(15) Obligations to Provide Assistance. The obligations of a party hereto to cooperate with, to assist or to provide assistance to another party hereunder shall be construed as an obligation to use the party’s personnel resources to the extent reasonably available in the context of performance of their normal duties, and not to incur material additional overtime or third-party expense unless requested and reimbursed by the assisted party.

(16) Party Bearing Cost of Performance. All obligations or responsibilities undertaken by each party hereto shall be performed at the cost of the party undertaking the obligation or responsibility, unless the other party has expressly agreed herein to bear all or a portion of the cost, either directly or by reimbursement to the other party.

(17) Entire Agreement. This Agreement contains the entire agreement between the parties hereto with respect to the transactions contemplated by this Agreement. Without limiting

the generality of the foregoing, this Agreement shall completely and fully supersede all other understandings and agreements among the parties hereto with respect to such transactions.

(18) Counterparts. This Agreement may be executed in any number of original counterparts. All such counterparts shall constitute but one and the same Agreement.

(19) Governing Law. This Agreement shall be governed by and construed in accordance with the applicable laws of the Commonwealth.

(20) Severability. Each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Agreement is held to be invalid, unenforceable or illegal to any extent, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Agreement. If any such provision of this Agreement is held to be invalid, unenforceable or illegal, the parties will promptly endeavor in good faith to negotiate new provisions to eliminate such invalidity, unenforceability or illegality and to restore this Agreement as nearly as possible to its original intent and effect.

(21) Drafting Responsibility. The parties hereto waive the application of any rule of law which otherwise would be applicable in connection with the construction of this Agreement that ambiguous or conflicting terms or provisions should be construed against the party who (or whose counsel) prepared the executed agreement or any earlier draft of the same.

(22) Interpolation. If any calculation hereunder is to be made by reference to a chart or table of values, and the reference calculation falls between two stated values, the calculation shall be made on the basis of linear interpolation.

(23) Accounting and Financial Terms. All accounting and financial terms used herein are, unless otherwise indicated, to be interpreted and applied in accordance with generally accepted accounting principles, consistently applied, in the United States.

(24) Consents. Any consent required to be given under this Agreement must be in writing.

(25) Third-Party Rights. This Agreement is exclusively for the benefit of the parties hereto and shall not provide any third parties (with the sole exceptions of the rights of the Lenders as provided in the Lenders' Remedies Agreement) with any remedy, claim, liability, reimbursement, cause of action or other rights.

(26) No Effect on Project Agreement. Nothing in this Agreement amends or modifies any obligations of the Systems Integrator or, to the extent applicable, [MATERIAL CONTRACT PARTY] and [GUARANTOR], to the MBTA under the Project Agreement.

ARTICLE 2

SIGNATORY WARRANTY

SECTION 2.1. MATERIAL CONTRACT PARTY. Each undersigned signatory for the Material Contract Party hereby represents and warrants that he or she is an officer of the Material Contract Party for which he or she has executed this Agreement and that he or she has full and complete authority to enter into this Agreement on behalf of the Material Contract Party. These representations and warranties are made for the purpose of inducing the Systems Integrator, the Guarantor and the MBTA to enter into this Agreement.

SECTION 2.2. GUARANTOR. The undersigned signatory for the Guarantor hereby represents and warrants that he or she is an officer of the Guarantor for which he or she has executed this Agreement and that he or she has full and complete authority to enter into this Agreement on behalf of the Guarantor. These representations and warranties are made for the purpose of inducing the Material Contract Party, the Systems Integrator and the MBTA to enter into this Agreement.

SECTION 2.3. SYSTEMS INTEGRATOR. The undersigned signatory for the Systems Integrator hereby represents and warrants that he or she is an officer of the Systems Integrator for which he or she has executed this Agreement and that he or she has full and complete authority to enter into this Agreement on behalf of the Systems Integrator. These representations and warranties are made for the purpose of inducing the Material Contract Party, the Guarantor and the MBTA to enter into this Agreement.

SECTION 2.4. MBTA. The undersigned signatory for the MBTA hereby represents and warrants that he or she is an officer of the MBTA and has full and complete authority to enter into this Agreement on behalf of the MBTA. These representations and warranties are made for the purpose of inducing the Material Contract Party, the Guarantor and the Systems Integrator to enter into this Agreement.

ARTICLE 3

WARRANTY AND LIABILITY

SECTION 3.1. MATERIAL CONTRACT PARTY'S WARRANTY AND LIABILITY.

(A) Material Contract Party Warranty. The Material Contract Party warrants to the MBTA that it has carried out and will continue to carry out its duties under the Material Contract in accordance with the Material Contract and that it has exercised and will continue to exercise in the performance of those duties the reasonable skill, care and diligence to be expected of a properly qualified member of its profession experienced in carrying out duties such as its duties under the Material Contract in relation to works of similar scope, nature and complexity to the portion of the Contract Services that is the subject of the Material Contract. In particular and without limiting the generality of the foregoing, the Material Contract Party covenants with the MBTA that it has carried out and will carry out and complete the portion of the Contract Services that is the subject of the Material Contract in accordance with the Material Contract and duly observe and perform all of its duties and obligations thereunder.

(B) Material Contract Party Liability. The Material Contract Party shall be entitled in any action or proceedings by the MBTA to raise equivalent rights in defense of liability (except for set off or counterclaim) as it would have against the Systems Integrator under the Material Contract, and shall have no liability under this Agreement that is of greater severity or of longer duration than it would have had if the MBTA had been a party to the Material Contract as a joint engager of the services of the Material Contract Party.

ARTICLE 4

STEP-IN RIGHTS IN FAVOR OF THE MBTA

SECTION 4.1. MBTA STEP-IN RIGHTS.

(A) Default Notice. The Material Contract Party and the Guarantor shall not exercise or seek to exercise any right which may be or become available to it to terminate, or treat as terminated or repudiated, the Material Contract or the Material Contract Party's engagement under the Material Contract or discontinue or suspend the performance of any duties or obligations under the Material Contract (including those with respect to any Material Contract Party Security) without first giving to the MBTA at least 45 days' prior written notice (the "**Default Notice**") in accordance with subsection (B) of this Section. The Material Contract Party shall not be entitled to terminate or treat as terminated or repudiated the Material Contract or the Material Contract Party's engagement under the Material Contract or discontinue or suspend its performance thereof unless and until:

(1) the MBTA delivers a notice to the Material Contract Party pursuant to subsection (C) of this Section during the MBTA Step-in Rights Period waiving its right to a MBTA Step-in hereunder; or

(2) the MBTA Step-in Rights Period has expired without the MBTA having given any notice to the Material Contract Party pursuant to subsection (C) of this Section.

(B) Contents of Default Notice. Any Default Notice given by the Material Contract Party to the MBTA pursuant to subsection (A) of this Section shall specify:

(1) the potential grounds for the Material Contract Party to exercise any right described in subsection (A) of this Section, together with details regarding any other unperformed obligations of, and uncured breaches by, the Systems Integrator under the Material Contract of which the Material Contract Party is aware;

(2) all amounts due and payable by the Systems Integrator to the Material Contract Party under the Material Contract, if any, on or before the date of such Default Notice and which remain unpaid at such date, and the nature of the System Integrator's obligation to pay such amounts; and

(3) the amount of any payments that the Material Contract Party reasonably foresees will become due and payable from the Systems Integrator to the Material Contract Party under the Material Contract prior to the expiration of the MBTA Step-in Rights Period.

(C) MBTA Step-in Notice. At any time on or prior to the 45th day after the MBTA's receipt of a Default Notice from the Material Contract Party pursuant to subsection (A) of this Section (the "**MBTA Step-in Rights Period**"), the MBTA may give notice (the "**MBTA Step-in Notice**") to the Material Contract Party and the Guarantor as to whether the MBTA (or their designee) shall from the date specified in such MBTA Step-in Notice (which date shall be no later than the last day of the MBTA Step-in Rights Period) assume all rights and obligations of, and succeed to the interests of, the Systems Integrator under the Material Contract, the Guaranty Agreement and any Material Contract Party Security to the exclusion and in place of the Systems Integrator.

(D) MBTA Step-in. On the date specified in the MBTA Step-in Notice, or any notice delivered pursuant to Section 4.2, upon which the MBTA will assume all rights and obligations of, and

succeed to the interests of, the Systems Integrator, the MBTA will thenceforth become the Systems Integrator under the Material Contract and the Guaranty Agreement to the exclusion of the Systems Integrator and thereupon the Material Contract Party and the Guarantor shall admit that the MBTA is the Systems Integrator under the Material Contract and the Guaranty Agreement, respectively and each of the Material Contract and the Guaranty Agreement shall be and remain in full force and effect. The MBTA shall also have the right to require the Material Contract Party and the Guarantor to:

- (1) consent to any assignment and transfer of the benefit of this Agreement, the Material Contract and the Guaranty Agreement to the MBTA or its designee;
- (2) enter into a novation agreement to effect such assignment and transfer; and
- (3) cause the issuer of any Material Contract Party Security to enter into such agreements or other documents as reasonably necessary to grant the MBTA the benefits previously available to the Systems Integrator under such Material Contract Party Security.

Upon any assignment and transfer effectuated pursuant to this subsection (a “**MBTA Step-in**”), the MBTA shall accept liability for the System’s Integrator’s obligations under the Material Contract and shall as soon as practicable thereafter cure any outstanding breach by the Systems Integrator which is capable of cure by the MBTA, in each case subject to the System Integrator’s rights under the terms of the Material Contract. Following a MBTA Step-in, the MBTA shall become responsible for all sums properly payable to the Material Contract Party under the Material Contract accruing due before and after such MBTA Step-in; provided, however that the MBTA shall in paying such sums be entitled to the same rights of set-off and deduction as would have applied to the Systems Integrator under the Material Contract.

SECTION 4.2. PROJECT AGREEMENT TERMINATION COVENANTS. The Material Contract Party and the Guarantor each further covenants with the MBTA that if the Project Agreement is terminated by the MBTA, it will, if requested by the MBTA by notice in writing and subject to Section 4.1 consent to a MBTA Step-in and accept the instructions of the MBTA to the exclusion of the Systems Integrator in respect of its duties under the Material Contract or the Guaranty Agreement, as the case may be, upon the terms and conditions thereof and will, if so requested in writing, enter into a novation agreement whereby the MBTA is substituted for the Systems Integrator under the Material Contract and the Guaranty Agreement.

SECTION 4.3. NOTICE OF PROJECT AGREEMENT TERMINATION. The Systems Integrator acknowledges that the Material Contract Party and the Guarantor will be entitled to rely on a notice given to it by the MBTA under Section 4.2 as conclusive evidence that the Project Agreement has been terminated by the MBTA.

SECTION 4.4. MBTA OBLIGATIONS TO MATERIAL CONTRACT PARTY. Notwithstanding anything contained in this Agreement and notwithstanding any payments which may be made by the MBTA to the Material Contract Party, the MBTA shall not be under any obligation to Material Contract Party or the Guarantor, nor will the Material Contract Party or any Guarantor have any claim or cause of action against the MBTA, unless and until the MBTA has given written notice to Material Contract Party and the Guarantor pursuant to Section 4.1. and Section 4.2 exercising its right to a MBTA Step-in.

SECTION 4.5. INCIDENTS. Notwithstanding anything to the contrary set forth in this Agreement, the MBTA shall have the right, following written notice to and consultation with the Systems Integrator, to direct the Material Contract Party to make the System, or any System Element, unavailable

to all or any of the Users (as such terms are defined in the Project Agreement) for such period of time as the MBTA reasonably determines necessary in accordance with Section 21.6 of the Project Agreement.

SECTION 4.6. EMERGENCIES. The Material Contract Party shall comply with all orders and directives given or issued by the MBTA or any Governmental Body (as such term is defined in the Project Agreement) having police power or regulatory jurisdiction based on any emergency condition. In the absence of any such order or directive, if an emergency occurs which threatens immediate loss or damage to property or safety of life, the Material Contract Party shall take all appropriate action to prevent threatened loss, damage, injury or death. The Material Contract Party shall notify the Systems Integrator and the MBTA of the situation and all actions taken immediately thereafter.

ARTICLE 5

ASSIGNMENT

SECTION 5.1. RESTRICTION ON ASSIGNMENT. No party to this Agreement may assign or transfer all or any part of its rights or obligations under this Agreement except as provided in this Article.

SECTION 5.2. ASSIGNMENT BY MATERIAL CONTRACT PARTY OR GUARANTOR. The Material Contract Party and the Guarantor may not assign or transfer any part of its rights or obligations hereunder without the prior written consent of the other parties hereto.

SECTION 5.3. ASSIGNMENT BY SYSTEMS INTEGRATOR. The Systems Integrator shall assign or transfer its rights and obligations under this Agreement to any permitted assignee of its interest in the Project Agreement concurrently with the assignment of the Project Agreement to such assignee, and the Material Contract Party, the Guarantor and the MBTA shall co-operate with the Systems Integrator in completing the formalities of any transfer or assignment including by executing any additional documents as may be reasonably required by the Systems Integrator.

SECTION 5.4. ASSIGNMENT BY MBTA. The MBTA shall assign or transfer its rights and obligations under this Agreement to any permitted assignee of its interest in the Project Agreement concurrently with the assignment of the Project Agreement to such assignee, and the Material Contract Party, the Guarantor and the Systems Integrator shall co-operate with the MBTA in completing the formalities of any transfer or assignment including by executing any additional documents as may be reasonably required by the MBTA.

ARTICLE 6

GENERAL

SECTION 6.1. TERM. This Agreement shall remain in effect until the expiration or earlier termination of the Material Contract in accordance with its terms.

SECTION 6.2. DISPUTES. In the event of any dispute between the parties hereto relating to this Agreement, the parties shall resolve the dispute in accordance with the Dispute Resolution Procedures set forth in Article 20 of the Project Agreement, as if set forth in full herein, except that references to “the Project Agreement” shall mean this Agreement, references to “claim” or “dispute” shall mean disputes under this Agreement, and other references specific to the Project Agreement shall be similarly construed to refer to comparable terms under this Agreement, with the Material Contract Party and the Guarantor having the same rights and obligations of the Systems Integrator under such Dispute Resolution Procedures.

SECTION 6.3. CONFLICT OR INCONSISTENCY. If there is any conflict or inconsistency between the provisions of this Agreement and the Project Agreement, the Material Contract or the Guaranty Agreement, the provisions of this Agreement shall prevail. Notwithstanding the foregoing, nothing in this Agreement amends or modifies (1) any of the System Integrator’s obligations under the Project Agreement, (2) any of the Material Contract Party’s obligations under the Material Contract, or (3) any of the Guarantor’s obligations under the Guaranty Agreement.

SECTION 6.4. VENUE. For the purposes of any legal actions or proceedings brought by any party hereto against the other party, the parties hereby irrevocably submit to the exclusive jurisdiction of the courts of the Commonwealth and acknowledge their competence and the convenience and propriety of the venue and agree to be bound by any judgment thereof and not to seek, and hereby waive, review of its merits by the courts of any other jurisdiction.

SECTION 6.5. WAIVER. The failure of any party to exercise any contractual right or remedy will not constitute a waiver thereof and no waiver will be effective, unless it is communicated in writing to the other party. A waiver of any right or remedy arising from a breach of this Agreement shall not constitute a waiver of any right or remedy arising from any other breach of this Agreement.

SECTION 6.6. CONFIDENTIALITY. The Material Contract Party and the Guarantor shall be bound to comply with the confidentiality obligations on the part of the Systems Integrator contained in the Project Agreement in relation to all information obtained from any other party under or in connection with the Project.

SECTION 6.7. BINDING EFFECT. This Agreement shall inure to the benefit of and shall be binding upon each of the MBTA, the Material Contract Party, the Guarantor and the Systems Integrator and any assignee acquiring an interest hereunder consistent with Article 5.

SECTION 6.8. NOTICES.

(A) Procedure. All notices, consents, approvals or written communications given pursuant to the terms of this Agreement will be in writing and will be considered to have been sufficiently given if delivered by hand or transmitted by facsimile or electronic transmission to the address, facsimile number or electronic mail address of each party set forth below in this Section, or to such other address, facsimile number or electronic mail address as any party may, from time to time, designate in the manner set forth above. Any such notice or communication will be considered to have been received: (1) if

delivered by hand during business hours (and in any event, at or before 5:00 pm local time in the place of receipt) on a Business Day, upon receipt by a responsible representative of the receiver, and if not delivered during business hours, upon the commencement of business hours on the next Business Day; (2) if sent by facsimile transmission during business hours (and in any event, at or before 5:00 pm local time in the place of receipt) on a Business Day, during business hours, upon the commencement of business hours on the next Business Day following confirmation of the transmission; and (3) if delivered by electronic mail during business hours (and in any event, at or before 5:00 pm local time in the place of receipt) on a Business Day, upon receipt, and if not delivered during business hours, upon the commencement of business hours on the next Business Day.

(B) MBTA Notice Address. Notices required to be given to the MBTA shall be addressed as follows:

[_____
[_____
[_____
Attention: [_____
Facsimile: [_____
Email: [_____]

with a copy to:

[_____
[_____
[_____
Attention: [_____
Facsimile: [_____
Email: [_____]

(C) Material Contract Party Notice Address. Notices required to be given to the Material Contract Party shall be addressed as follows:

[_____
[_____
[_____
Attention: [_____
Facsimile: [_____
Email: [_____]

(D) Guarantor Notice Address. Notices required to be given to the Guarantor shall be addressed as follows:

[_____
[_____
[_____
Attention: [_____
Facsimile: [_____
Email: [_____]

(E) Systems Integrator Notice Address. Notices required to be given to the Systems Integrator shall be addressed as follows:

[_____
[_____
[_____
Attention: [_____
Facsimile: [_____
Email: [_____]

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives on the day and year first above written.

[SIGNATURE PAGE TO BE DEVELOPED]

INDEPENDENT CERTIFIER AGREEMENT

for

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES

between

THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

and

[SYSTEMS INTEGRATOR]

and

[INDEPENDENT CERTIFIER]

Dated

[_____, 2017]

TABLE OF CONTENTS

Page

ARTICLE 1

DEFINITIONS AND INTERPRETATIONS

SECTION 1.1. DEFINITIONS..... 1
SECTION 1.2. INTERPRETATION. 2

ARTICLE 2

ROLE OF THE INDEPENDENT CERTIFIER

SECTION 2.1. ENGAGEMENT..... 4
SECTION 2.2. ACKNOWLEDGEMENT BY INDEPENDENT CERTIFIER..... 4
SECTION 2.3. STANDARD OF CARE..... 4
SECTION 2.4. DUTY OF INDEPENDENT JUDGMENT. 4
SECTION 2.5. DETERMINATIONS AND CONCLUSIONS..... 5
SECTION 2.6. AUTHORITY TO ACT..... 5
SECTION 2.7. KNOWLEDGE OF THE MBTA’S AND SYSTEMS INTEGRATOR’S
REQUIREMENTS. 6
SECTION 2.8. COORDINATION BY INDEPENDENT CERTIFIER. 6
SECTION 2.9. CONFLICT OF INTEREST..... 7
SECTION 2.10. INDEPENDENT CERTIFIER PERSONNEL. 7
SECTION 2.11. OBLIGATIONS OF OTHERS..... 7

ARTICLE 3

ROLE OF THE MBTA AND THE SYSTEMS INTEGRATOR

SECTION 3.1. ASSISTANCE..... 7
SECTION 3.2. INSTRUCTIONS IN WRITING. 8
SECTION 3.3. INFORMATION AND SERVICES..... 8
SECTION 3.4. ADDITIONAL INFORMATION..... 8
SECTION 3.5. RIGHT TO ENTER AND INSPECT. 8
SECTION 3.6. PERFORMANCE OF OBLIGATIONS UNDER THE PROJECT
AGREEMENT NOT RELIEVED. 9
SECTION 3.7. LIABILITY FOR ACTIONS OF INDEPENDENT CERTIFIER..... 9

ARTICLE 4

SUSPENSION OF SERVICES

SECTION 4.1. NOTICE..... 9
SECTION 4.2. COSTS OF SUSPENSION..... 9
SECTION 4.3. RECOMMENCEMENT..... 10

ARTICLE 5

INSURANCE AND LIABILITY

SECTION 5.1. INDEPENDENT CERTIFIER’S PROFESSIONAL INDEMNITY INSURANCE. 10
SECTION 5.2. WORKERS’ COMPENSATION INSURANCE. 10
SECTION 5.3. COPIES OF POLICIES. 10

ARTICLE 6

PAYMENT FOR SERVICES

SECTION 6.1. FEE. 11

ARTICLE 7

ADDITIONAL SERVICES

SECTION 7.1. NOTICE OF ADDITIONAL SERVICES. 11
SECTION 7.2. ADDITIONAL SERVICES PROCEDURE. 12
SECTION 7.3. COST OF ADDITIONAL SERVICES. 12

ARTICLE 8

TERM AND TERMINATION

SECTION 8.1. TERM. 13
SECTION 8.2. NOTICE OF BREACH. 13
SECTION 8.3. TERMINATION FOR BREACH. 13
SECTION 8.4. TERMINATION FOR FINANCIAL DIFFICULTY. 13
SECTION 8.5. TERMINATION FOR CONVENIENCE. 13
SECTION 8.6. PROCEDURE UPON TERMINATION. 14
SECTION 8.7. EFFECT OF TERMINATION. 14
SECTION 8.8. SURVIVAL. 14

ARTICLE 9

INDEMNITY

SECTION 9.1. INDEPENDENT CERTIFIER’S OBLIGATION TO INDEMNIFY. 14

ARTICLE 10

MISCELLANEOUS PROVISIONS

SECTION 10.1. RELATIONSHIP OF THE PARTIES. 15
SECTION 10.2. INDEPENDENT CERTIFIER PERSONS. 15
SECTION 10.3. GENERAL INDEPENDENT CERTIFIER ASSUMPTION OF RISK. 15
SECTION 10.4. WAIVER. 16
SECTION 10.5. NOTICES. 16

| | | |
|----------------|---|----|
| SECTION 10.6. | TRANSFER AND ASSIGNMENT..... | 16 |
| SECTION 10.7. | CONFIDENTIALITY. | 17 |
| SECTION 10.8. | PROJECT MATERIAL..... | 17 |
| SECTION 10.9. | TIME OF THE ESSENCE. | 18 |
| SECTION 10.10. | AMENDMENT. | 18 |
| SECTION 10.11. | BINDING EFFECT..... | 18 |
| SECTION 10.12. | REPRESENTATIONS AND WARRANTIES OF THE INDEPENDENT CERTIFIER..... | 18 |

APPENDICES

1. INDEPENDENT CERTIFIER PERSONNEL
2. COMPENSATION AND PAYMENT OF INDEPENDENT CERTIFIER

INDEPENDENT CERTIFIER AGREEMENT

THIS INDEPENDENT CERTIFIER AGREEMENT (this “Agreement”) is made and entered into as of _____, 2017, between the Massachusetts Bay Transportation Authority (the “MBTA”), [NAME OF THE INDEPENDENT CERTIFIER], organized and existing under the laws of [_____] and authorized to do business in the Commonwealth of Massachusetts (the “Independent Certifier”), and [Systems Integrator], a [___] company, organized and existing under the laws of the [___] and authorized to do business in the Commonwealth of Massachusetts (the “Systems Integrator”).

RECITALS

WHEREAS, the MBTA and the Systems Integrator have entered into a Project Agreement, dated as of [_____,] 2017, as the same may be amended or modified from time to time (the “Project Agreement”), for the design, implementation, installation, integration, testing, financing, operation, maintenance and management of an automated fare collections system, as more fully described in the Project Agreement (the “System”);

WHEREAS, the MBTA and the Systems Integrator wish to appoint the Independent Certifier, and the Independent Certifier wishes to accept such appointment, to perform certain services in connection with the Project Agreement; and

WHEREAS, the MBTA, the Systems Integrator and the Independent Certifier wish to enter into this Agreement in order to record the terms by which the Independent Certifier will perform such services.

NOW, THEREFORE, in consideration of the mutual promises and agreements of the parties herein expressed and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties covenant and agree as follows:

ARTICLE 1

DEFINITIONS AND INTERPRETATIONS

SECTION 1.1. DEFINITIONS.

Unless otherwise specified or the context otherwise requires, capitalized but otherwise undefined terms in this Agreement shall have the respective meanings given to such terms in the Project Agreement, and the following terms will have the following meanings:

“**Additional Services**” means any additions or changes to the Services.

“**Agreement**” means this Agreement including any recitals, schedules and appendices to this agreement, as amended, supplemented or restated from time to time.

“**Fee**” means the amount properly payable to, and invoiced by, the Independent Certifier for the Services, as such fees are specified and made payable in this Agreement.

“**Project Documents**” means, collectively, the Project Agreement and any other agreement (other than this Agreement) entered into from time to time by the MBTA and the Systems

Integrator (with or without other parties) in connection with the Project; and “Project Document” means any one of the foregoing.

“**Project Material**” means all material:

(1) provided to the Independent Certifier or created by or required to be created by either the MBTA or the Systems Integrator; and

(2) provided by or created by or required to be created by the Independent Certifier as part of, or for the purpose of, performing the Services,

including documents, equipment, reports, technical information, plans, charts, drawings, calculations, tables, schedules and data (stored and recorded by any means).

“**Services**” means:

(1) all of the services performed by and obligations conferred on the Independent Certifier under the Project Agreement;

(2) all of the services performed by and obligations conferred on the Independent Certifier under this Agreement; and

(3) all other obligations or tasks which the Independent Certifier is required to do to comply with its obligations under this Agreement.

SECTION 1.2. INTERPRETATION.

This Agreement shall be interpreted according to the following provisions, except to the extent that the context or the express provisions of this Agreement otherwise require.

(A) Plurality. Words importing the singular number mean and include the plural number and vice versa.

(B) Persons. Words importing persons include individuals, legal personal representatives, firms, companies, associations, joint ventures, general partnerships, limited partnerships, limited liability partnerships, limited liability companies, trusts, business trusts, corporations, governmental bodies, and other legal entities.

(C) Headings. The table of contents and any headings preceding the text of the Articles, Sections and subsections of this Agreement shall be solely for convenience of reference and shall not affect its meaning, construction or effect.

(D) References Hereto. The terms “hereby,” “hereof,” “herein,” “hereunder” and any similar terms refer to this Agreement.

(E) References to Days and Time of Day. All references to days herein are references to calendar days, unless otherwise indicated, such as by reference to Business Days. Each reference to time of day is a reference to Eastern Standard time or Eastern Daylight Saving time, as the case may be.

(F) References to Business Days. If the time for doing an act falls or expires on a day that is not a Business Day, the time for doing such act shall be extended to the next Business Day.

(G) References to Including. The words “include”, “includes” and including” are to be construed as meaning “include without limitation”, “includes without limitation” and “including without limitation”, respectively.

(H) References to Statutes. Each reference to a statute or statutory provision includes any statute or statutory provision which amends, extends, consolidates or replaces the statute or statutory provision or which has been amended, extended, consolidated or replaced by the statute or statutory provision and includes any orders, regulations, by-laws, ordinances, orders, codes of practice or instruments made under the relevant statute.

(I) References to Governmental Bodies. Each reference to a Governmental Body is deemed to include a reference to any successor to such Governmental Body or any organization or entity or organizations or entities which has or have taken over the functions or responsibilities of such Governmental Body.

(J) References to Documents and Standards. Each reference to an agreement, document, standard, principle or other instrument includes (subject to all relevant approvals and any other provision of this Agreement expressly concerning such agreement, document, standard, principle or other instrument) a reference to that agreement, document, standard, principle or instrument as amended, supplemented, substituted, novated or assigned.

(K) References to All Reasonable Efforts. The expression “all reasonable efforts” and expressions of like import, when used in connection with an obligation of the MBTA, the Independent Certifier, the Systems Integrator, or any other Systems Integrator representatives, means taking in good faith and with due diligence all commercially reasonable steps to achieve the objective and to perform the obligation, including doing all that can reasonably be done in the circumstances taking into account each party’s obligations hereunder to mitigate delays and additional costs to the other party, and in any event taking no less steps and efforts than those that would be taken by a commercially reasonable and prudent person in comparable circumstances but where the whole of the benefit of the obligation and where all the results of taking such steps and efforts accrued solely to that person’s own benefit.

(L) Entire Agreement. This Agreement contains the entire agreement between the parties hereto with respect to the transactions contemplated by this Agreement. Without limiting the generality of the foregoing, this Agreement shall completely and fully supersede all other understandings and agreements among the parties with respect to such transactions.

(M) Counterparts. This Agreement may be executed in any number of original counterparts. All such counterparts shall constitute but one and the same Agreement.

(N) Governing Law. This Agreement shall be governed by and construed in accordance with the applicable laws of the State.

(O) Severability. Each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Agreement is held to be invalid, unenforceable or illegal to any extent, such provision may be severed and such invalidity, unenforceability or illegality shall not prejudice or affect the validity, enforceability and legality of the remaining provisions of this Agreement. If any such provision of this Agreement is held to be invalid, unenforceable or illegal, the parties will promptly endeavor in good faith to negotiate new provisions to eliminate such invalidity,

unenforceability or illegality and to restore this Agreement as nearly as possible to its original intent and effect.

(P) Drafting Responsibility. The parties waive the application of any rule of law which otherwise would be applicable in connection with the construction of this Agreement that ambiguous or conflicting terms or provisions should be construed against the party who (or whose counsel) prepared the executed agreement or any earlier draft of the same.

(Q) Accounting and Financial Terms. All accounting and financial terms used herein are, unless otherwise indicated, to be interpreted and applied in accordance with generally accepted accounting principles, consistently applied, in the United States.

(R) Consents. Any consent required to be given under this Agreement must be in writing.

ARTICLE 2

ROLE OF THE INDEPENDENT CERTIFIER

SECTION 2.1. ENGAGEMENT.

The MBTA and the Systems Integrator hereby appoint the Independent Certifier, and the Independent Certifier hereby accepts such appointment, to carry out the Services in accordance with this Agreement. The Independent Certifier will perform the Services in accordance with this Agreement and unless stated otherwise, where there is an inconsistency between this Agreement and the Project Agreement, the terms of the Project Agreement shall prevail.

SECTION 2.2. ACKNOWLEDGEMENT BY INDEPENDENT CERTIFIER.

The Independent Certifier hereby acknowledges in favor of the MBTA and the Systems Integrator that it has received a copy of the Project Agreement. The Independent Certifier acknowledges that the MBTA and the Systems Integrator shall each rely upon the performance of the Services by the Independent Certifier, including all determinations and findings of fact, the expression of all opinions and conclusions, the issuance of all certificates, and accordingly, the Independent Certifier shall use its best skills and judgment in providing the Services.

SECTION 2.3. STANDARD OF CARE.

The Independent Certifier shall in all respects act as an independent professional. The Independent Certifier represents and warrants that it does and shall at all times during the term of this Agreement possess and exercise the standard of skill, care and diligence in the performance of the Services that would be expected of an expert professional experienced in providing each of the services falling within the definition of the Services as set forth in Section 1.1 of this Agreement.

SECTION 2.4. DUTY OF INDEPENDENT JUDGMENT.

In exercising the Services, the Independent Certifier will act:

(1) impartially and independently of the MBTA and the Systems Integrator, giving fair consideration to the interests and views of each in accordance with the terms of this Agreement and the Project Agreement;

(2) reasonably, honestly and professionally in all respects, and in accordance with the highest standards of commercial integrity; and

(3) in a timely manner in its performance of the Services:

(a) in accordance with the times prescribed in this Agreement or the Project Agreement, as applicable; or

(b) where no times are prescribed, within five Business Days or such earlier time so as to enable the MBTA and the Systems Integrator to perform their respective obligations under the Project Agreement.

SECTION 2.5. DETERMINATIONS AND CONCLUSIONS.

(A) Independent Professional Judgment. All determinations of fact and the drawing of conclusion based upon any facts so determined shall be made in the exercise of the Independent Certifier's independent professional judgment. Although the Independent Certifier should take account of any opinions or representations made by the MBTA and the Systems Integrator, and their respective professional advisors and consultants, the Independent Certifier shall not be bound to comply with any opinions, representations, requests or directions made by either the MBTA, the Systems Integrator, or their respective professional advisors and consultants in connection with any matter on which the Independent Certifier is required to exercise its professional judgment. Notwithstanding the foregoing, the Independent Certifier shall accept all agreed statements of fact made by the MBTA and the Systems Integrator jointly.

(B) Best Skill and Judgment. The Independent Certifier will use its best skill and judgment in providing the Services and making any certifications.

SECTION 2.6. AUTHORITY TO ACT.

The Independent Certifier:

(1) is an independent consultant and is not, and will not purport to be, a partner, joint venturer or agent of either the MBTA or the Systems Integrator;

(2) has no direct or indirect material interest in or connection with, and it will not at any time have any direct or indirect material interest in or connection with, any person, trust, partnership, joint venture or other entity that is not at arm's length to the MBTA or the Systems Integrator;

(3) has no direct or indirect material interest in, and will not at any time have a direct or indirect interest in, the Full Service Commencement Certificate with respect to the Project except with respect to the performance of the Services under this Agreement and the payment of its Fee;

(4) other than as may be expressly set out in this Agreement or the Project Agreement, has no authority to give any directions to the MBTA or the Systems Integrator, or either of their officers, employees, contractors, consultants or agents;

(5) has no authority to waive or alter any terms of the Project Agreement, nor to discharge or release either the MBTA or the Systems Integrator from any of its obligations under the Project Agreement unless jointly agreed in writing by the MBTA and the Systems Integrator;

(6) shall act in accordance with the joint direction of the MBTA and the Systems Integrator provided that the directions are not inconsistent with the other terms of this Agreement or the terms of the Project Agreement and do not vary or prejudice the Independent Certifier's authority or responsibility or the exercise by the Independent Certifier of its professional judgment under this Agreement; and

(7) is not aware of any other circumstances or relationships, having made due inquiries with respect thereto, that could reasonably be perceived to constitute a conflict of interest with respect to the performance of the Services, or its role as Independent Certifier.

SECTION 2.7. KNOWLEDGE OF THE MBTA'S AND SYSTEMS INTEGRATOR'S REQUIREMENTS.

The Independent Certifier warrants that:

(1) it has and will be deemed to have informed itself fully of the requirements of the Project Agreement;

(2) it will inform itself fully of the requirements of such other documents and materials as may become relevant from time to time to the performance of the Services;

(3) without limiting items (1) or (2) of this Section, it has and will be deemed to have informed itself fully of all time limits and other requirements for any Services which the Independent Certifier carries out under the Project Agreement and this Agreement;

(4) it has and will be deemed to have informed itself fully of the nature of the work necessary for the performance of the Services and the means of access to each Location, Vehicle and Retail Reload Location, and the Model Office, as such terms are defined in the Project Agreement, including restrictions on any such access or protocols that are required; and

(5) it has satisfied itself as to the correctness and sufficiency of its proposal for the Services and that the Fee covers the cost of complying with all of the obligations under this Agreement and of all matters and things necessary for the due and proper performance and completion of the Services.

SECTION 2.8. COORDINATION BY INDEPENDENT CERTIFIER.

The Independent Certifier shall:

(1) fully cooperate with the MBTA, the Systems Integrator and Commonwealth agencies and other Governmental Bodies having jurisdiction;

(2) carefully coordinate the Services with the work and services performed by the MBTA and the Systems Integrator;

(3) perform the Services so as to avoid unreasonably interfering with, disrupting or delaying the work and services performed by the MBTA and the Systems Integrator; and

(4) provide copies to the MBTA and the Systems Integrator of all reports, communications, certificates and other documentation that it provides to either the MBTA or the Systems Integrator.

SECTION 2.9. CONFLICT OF INTEREST.

The Independent Certifier warrants that:

(1) in addition to the warranties set out in subsections 2.6(2) and 2.6(7) of this Agreement, at the date of signing this Agreement, no conflict of interest exists or is likely to arise in the performance of its obligations under this Agreement; and

(2) if, during the term of this Agreement, any such conflict or risk of conflict of interest arises, or there is reasonable apprehension that a conflict of interest has arisen or may arise, the Independent Certifier shall immediately notify the MBTA and the Systems Integrator in writing of that conflict or risk of conflict and shall take such steps as may be required by the MBTA and the Systems Integrator to avoid, or (where it is not possible to avoid that conflict) mitigate that conflict or risk to the greatest extent possible, or (where it is not possible to avoid that conflict, and the MBTA and the Systems Integrator jointly request) resign.

SECTION 2.10. INDEPENDENT CERTIFIER PERSONNEL.

(A) Personnel to be Used. Subject to subsection (B) of this Section, the Independent Certifier will use the partners, directors or employees identified in Appendix 1 to this Agreement in connection with the performance of the Services and such persons' services will be available for so long as may be necessary to ensure the proper performance by the Independent Certifier of the Services. Such persons will have full authority to act on behalf of the Independent Certifier for all purposes in connection with this Agreement.

(B) Removal and Replacement. None of the persons listed in Appendix 1 to this Agreement will be removed or replaced unless such person ceases to work as a partner in or a director or employee of the Independent Certifier or such person is unable to work because of death or illness. The Independent Certifier shall notify the MBTA and the Systems Integrator of any such circumstances and shall be responsible for finding a replacement who will previously have been approved in writing by the MBTA and the Systems Integrator.

SECTION 2.11. OBLIGATIONS OF OTHERS.

Nothing in this Agreement or the Project Agreement shall be interpreted or construed to render the Independent Certifier responsible for the performance of the design or implementation of the Project, or for the performance of any obligation of the Systems Integrator, or the professional responsibility of any of the other professionals of record, with respect to the Project.

ARTICLE 3

ROLE OF THE MBTA AND THE SYSTEMS INTEGRATOR

SECTION 3.1. ASSISTANCE.

The MBTA and the Systems Integrator agree to cooperate with and provide reasonable assistance to the Independent Certifier to familiarize the Independent Certifier with all necessary aspects

of the Project and to enable the Independent Certifier to carry out its obligations under this Agreement. Neither the MBTA nor the Systems Integrator shall in any way obstruct or otherwise impede or interfere with the performance of the Services by the Independent Certifier.

SECTION 3.2. INSTRUCTIONS IN WRITING.

All instructions given to the Independent Certifier by the MBTA and the Systems Integrator shall be in writing.

SECTION 3.3. INFORMATION AND SERVICES.

The MBTA and the Systems Integrator will each make available to the Independent Certifier, as soon as practicable from time to time, all information, documents and particulars necessary for the Independent Certifier to carry out the Services, including such information, documents and particulars required in order for the Independent Certifier to determine whether the Criteria for Full Service Commencement, as defined in the Project Agreement, have been achieved, and will provide copies of all such information, documents and particulars to the other party.

SECTION 3.4. ADDITIONAL INFORMATION.

(A) Requests by Independent Certifier. If any information, documents or particulars are reasonably required to enable the Independent Certifier to perform the Services and have not been provided by the Systems Integrator or the MBTA, as the case may be, then:

- (1) the Independent Certifier will give notice in writing to the MBTA or the Systems Integrator, as the case may be, of the details of the information, documents or particulars demonstrating the need and the reasons why they are required; and
- (2) the MBTA or the Systems Integrator, as the case may be, will arrange the provision of the required information, documents or particulars.

(B) Failure to Provide Requested Information. Where any information is requested pursuant to subsection (A) of this Section, and is not provided within 10 Business Days of the date on which it was requested, then the Independent Certifier shall notify the other party of the details of the information required, and explain the need for that information to be provided by the other party. Any failure or refusal to provide such information may be submitted for Non-Binding Mediation.

SECTION 3.5. RIGHT TO ENTER AND INSPECT.

Upon giving reasonable notice to the Systems Integrator, the Independent Certifier (and any person authorized by it) may enter and inspect each Location, each Vehicle, each Retail Reload Location, the Model Office, Project and work in progress at any reasonable time in connection with the exercise or proposed exercise of rights under this Agreement, subject to:

- (1) observance of the reasonable rules of the Systems Integrator as to safety and security for the Locations, Vehicles, Retail Reload Locations, Model Office, Project and work in progress;
- (2) not causing unreasonable delay to the carrying out of the work by reason of its presence at the Project; and

(3) not causing any damage to the Locations, Vehicles, Retail Reload Locations, Model Office, Project or work in progress.

SECTION 3.6. PERFORMANCE OF OBLIGATIONS UNDER THE PROJECT AGREEMENT NOT RELIEVED.

Neither the MBTA nor the Systems Integrator shall be relieved from its obligations to perform their respective obligations, or from any other liabilities, under the Project Agreement at the time and in the manner contemplated in the Project Agreement by reason of the appointment of or the performance or non-performance of the Services by the Independent Certifier.

SECTION 3.7. LIABILITY FOR ACTIONS OF INDEPENDENT CERTIFIER.

In no event will the MBTA or the Systems Integrator be liable to one another for any act or omission by the Independent Certifier whether under, or purportedly under, a provision of the Project Agreement, this Agreement or otherwise, provided that any such act or omission will not extinguish, relieve, limit or qualify the nature or extent of any right or remedy of either the MBTA or the Systems Integrator against or any obligation or liability of either the MBTA or the Systems Integrator which would have existed regardless of such act or omission.

ARTICLE 4

SUSPENSION OF SERVICES

SECTION 4.1. NOTICE.

The Services (or any part) may be suspended at any time by the MBTA and the Systems Integrator:

(1) if the Independent Certifier fails to comply with its obligations under this Agreement, immediately by the MBTA and the Systems Integrator giving joint notice in writing to the Independent Certifier; or

(2) in any other case, by the MBTA and the Systems Integrator giving seven Business Days joint notice in writing to the Independent Certifier.

SECTION 4.2. COSTS OF SUSPENSION.

The Independent Certifier shall:

(1) subject to the Independent Certifier complying with Article 8, be entitled to recover the extra costs incurred by the Independent Certifier by reason of a suspension directed under Section 4.1(2) of this Agreement valued as an Additional Service under Article 7 of this Agreement; and

(2) have no entitlement to be paid any costs, expenses, losses or damages arising from a suspension under Section 4.1(1) of this Agreement.

SECTION 4.3. RECOMMENCEMENT.

The Independent Certifier shall immediately recommence the carrying out of the Services (or any part) upon receipt of a joint written notice from the MBTA and the Systems Integrator requiring it to do so.

ARTICLE 5

INSURANCE AND LIABILITY

SECTION 5.1. INDEPENDENT CERTIFIER'S PROFESSIONAL INDEMNITY INSURANCE.

(A) The Independent Certifier will have in place at all times during the term of this Agreement:

(1) professional errors and omissions insurance:

(a) in the amount of [\$10 million] per claim and in the aggregate, a deductible of not more than [\$250,000] per claim and from an insurer and on terms satisfactory to the MBTA and the Systems Integrator;

(b) with a term and extended reporting period from the date of this Agreement until the expiration of [10 years] from the cessation of the Services; and

(c) covering liability which the Independent Certifier might incur as a result of a breach by it of its obligations or any breach owed by the Independent Certifier in a professional capacity to the MBTA or the Systems Integrator, or either of them, under or in connection with this Agreement or the provision of the Services; and

(2) comprehensive general liability insurance in the amount of [\$10 million] per claim and in the aggregate, no deductible for personal injury or bodily injury, a deductible of not more than [\$50,000] per occurrence for property damage and from an insurer and on terms satisfactory to the MBTA and the Systems Integrator.

(B) The Independent Certifier will provide copies of its insurance policies to the MBTA and the Systems Integrator upon request.

SECTION 5.2. WORKERS' COMPENSATION INSURANCE.

The Independent Certifier will, at its own cost, insure its liability (including its common law liability) at all times during the term of this Agreement as required under any applicable workers compensation statute or regulation in relation to its employees engaged in the Services.

SECTION 5.3. COPIES OF POLICIES.

The Independent Certifier shall provide copies of its insurance policies to the MBTA and the Systems Integrator upon request.

ARTICLE 6

PAYMENT FOR SERVICES

SECTION 6.1. FEE.

(A) Fee. The Systems Integrator and the MBTA hereby acknowledge and agree that the Fee shall not exceed [\$_____] (the “Fee Ceiling”). The Fee Ceiling may be increased through an amendment to this Agreement where the Systems Integrator and the MBTA mutually agree.

(B) Systems Integrator Responsibilities. In consideration of the Independent Certifier performing the Services in accordance with this Agreement, the Systems Integrator shall pay the Independent Certifier 100% of the portion of the Fee owed each month and shall invoice the MBTA monthly for 50% of the amount paid. The MBTA shall pay the Systems Integrator the amount invoiced in accordance with this Section within 30 days of its receipt of the invoice from the Systems Integrator, subject to the restrictions set forth in Appendix 2.

(C) Sole Compensation to Independent Certifier. The Fee, as it may be adjusted pursuant to Section 7.3 of this Agreement, includes all taxes, disbursements and expenses (including accommodation, car hire, equipment and travel expenses), overhead and profit to perform the Services.

(D) Certification by Independent Certifier. The MBTA and the Systems Integrator acknowledge and agree that if any amount due and payable by the Systems Integrator to the Independent Certifier is outstanding, the Independent Certifier will not have any obligation to make any certification hereunder.

ARTICLE 7

ADDITIONAL SERVICES

SECTION 7.1. NOTICE OF ADDITIONAL SERVICES.

(A) Notice and Claim Submittals. If the Independent Certifier believes, other than a “Additional Services Order” under Section 7.2, that any direction by the MBTA and the Systems Integrator constitutes or involves Additional Services it shall:

(1) within seven Business Days after receiving the direction and before commencing work on the subject matter of the direction, give notice to the MBTA and the Systems Integrator that it considers that the direction constitutes or involves Additional Services; and

(2) within 21 days after giving the notice under subsection (A)(1) of this Section, submit a written claim to the MBTA and the Systems Integrator which includes detailed particulars of the claim, the amount of the claim and how it was calculated.

(B) Continuance of Services. Regardless of whether the Independent Certifier considers that a direction given by the MBTA and the Systems Integrator constitutes or involves Additional Services, the Independent Certifier shall continue to perform the Services in accordance with this Agreement and all directions, including any direction in respect of which notice has been given under this Section.

SECTION 7.2. ADDITIONAL SERVICES PROCEDURE.

(A) Additional Services Price Request. The MBTA and the Systems Integrator may jointly issue a document titled “Additional Services Price Request” to the Independent Certifier which shall set out details of a proposed Additional Services which the MBTA and the Systems Integrator are considering.

(B) Notice of Effects of Additional Services Price Request. Within seven Business Days after the receipt of an Additional Services Price Request, the Independent Certifier shall provide the MBTA and the Systems Integrator with a written notice in which the Independent Certifier sets forth the effect which the proposed Additional Services will have on the Fee.

(C) Additional Services Order. Following the receipt of the notice delivered pursuant to subsection (B) of this Section, the MBTA and the Systems Integrator may jointly direct the Independent Certifier to carry out Additional Services by written document titled “Additional Services Order” which shall state either that:

- (1) the Fee shall be adjusted as set out in the Independent Certifier’s notice provided pursuant to subsection (B) of this Section; or
- (2) the adjustment (if any) to the Fee will be determined under Section 7.3 of this Agreement.

SECTION 7.3. COST OF ADDITIONAL SERVICES.

(A) Adjustment of Fee. Subject to Section 7.2, the Fee shall be adjusted for all Additional Services or suspensions under Section 4.1(2) of this Agreement carried out by the Independent Certifier by:

- (1) the amount (if any) stated in the “Additional Services Order” in accordance with Section 7.3(C) of this Agreement;
- (2) if subsection (A)(1) of this Section is not applicable, an amount determined pursuant to a fee schedule agreed to by the MBTA, the Systems Integrator and the Independent Certifier within 30 days following execution of this Agreement; or
- (3) where such rates or prices are not applicable, a reasonable amount to be agreed between the MBTA, the Systems Integrator and the Independent Certifier or, failing agreement, an amount determined pursuant to the Non-Binding Mediation.

(B) Fee Reductions. Any reductions in the Fee due to Additional Services or suspensions under Section 4.1(2) of this Agreement shall be calculated on the same basis as any increases as set forth in subsection (A) of this Section.

(C) No Adjustment for Failure to Comply. If the Independent Certifier fails to comply with Section 7.1 of this Agreement, the Fee shall not be adjusted as a result of the relevant direction.

ARTICLE 8

TERM AND TERMINATION

SECTION 8.1. TERM.

Subject to earlier termination pursuant to this Article 8, this Agreement shall terminate 60 days following the Full Service Commencement Date.

SECTION 8.2. NOTICE OF BREACH.

If the Independent Certifier commits a breach of this Agreement, the MBTA and the Systems Integrator may give written notice to the Independent Certifier:

- (1) specifying the breach; and
- (2) directing the Independent Certifier to rectify the breach in the period specified in the notice, such period being not less than seven Business Days from the date of receipt of such notice by the Independent Certifier.

SECTION 8.3. TERMINATION FOR BREACH.

In the event the Independent Certifier fails to rectify a breach within the period specified in the notice issued under Section 8.2 of this Agreement, the MBTA and the Systems Integrator may, without prejudice to any other rights of the MBTA and the Systems Integrator, or either of them, immediately terminate this Agreement.

SECTION 8.4. TERMINATION FOR FINANCIAL DIFFICULTY.

The MBTA and the Systems Integrator may, without prejudice to any other rights which the MBTA and the Systems Integrator, or either of them may have, terminate this Agreement immediately if:

- (1) events have occurred or circumstances exist which, in the opinion of the MBTA and the Systems Integrator, may result in or have resulted in insolvency or the control of the Independent Certifier passing to another body or corporation; or
- (2) the Independent Certifier has communications with its creditors with a view toward entering into, or enters into, any form of compromise, arrangement or moratorium of any debts whether formal or informal, with its creditors.

SECTION 8.5. TERMINATION FOR CONVENIENCE.

(A) Generally. Notwithstanding anything to the contrary in this Agreement and subject to subsection (B) of this Section, the MBTA and the Systems Integrator may at any time jointly terminate this Agreement upon 30 days written notice to the Independent Certifier stating that termination is for convenience pursuant to this Section.

(B) Independent Certifier's Rights. Upon a termination under subsection (A) of this Section, the Independent Certifier shall:

(1) be entitled to be reimbursed by the MBTA and the Systems Integrator for the value of the Services performed by the Independent Certifier through the date of termination; and

(2) not be entitled to any damages or other compensation with respect to the termination and (without limitation) any amount with respect to:

(a) the lost opportunity to earn a profit with respect to the Services not performed at the date of termination; and

(b) any lost opportunity to recover overhead from the revenues which would have been generated under this Agreement but for it being terminated.

SECTION 8.6. PROCEDURE UPON TERMINATION.

Upon completion of the Independent Certifier's engagement under this Agreement or earlier termination of this Agreement, the Independent Certifier shall:

(1) cooperate with the MBTA and the Systems Integrator;

(2) hand to the MBTA and the Systems Integrator all Project Material and all other information concerning the Project held or prepared by the Independent Certifier; and

(3) as and when required by the MBTA and the Systems Integrator, meet with the MBTA and the Systems Integrator and such other persons nominated by them with a view to providing them with sufficient information to enable the MBTA and the Systems Integrator to execute the Project or the persons nominated to provide the Services.

SECTION 8.7. EFFECT OF TERMINATION.

Except as otherwise expressly provided in this Agreement, the termination of this Agreement by the MBTA and the Systems Integrator shall be without prejudice to any accrued rights and obligations under this Agreement as of the date of termination (including the right of the MBTA and the Systems Integrator to recover damages from the Independent Certifier).

SECTION 8.8. SURVIVAL.

Termination of this Agreement shall not affect the continuing rights and obligations of the MBTA or the Systems Integrator and the Independent Certifier under any Section of this Agreement which is expressed to survive termination or which is required to give effect to such termination or the consequences of such termination.

ARTICLE 9

INDEMNITY

SECTION 9.1. INDEPENDENT CERTIFIER'S OBLIGATION TO INDEMNIFY.

The Independent Certifier will indemnify and save harmless the MBTA and the Systems Integrator, and each of them, and their respective employees, agents, officers and directors from and against any and all losses incurred or suffered by any of them by reason of, resulting from, in connection with, or arising out of:

(A) the breach of any representation, warranty, covenant, term, duty or obligation of the Independent Certifier set out in or arising under this Agreement or the Project Agreement; or

(B) any act or omission of the Independent Certifier in connection with the subject matters of this Agreement.

ARTICLE 10

MISCELLANEOUS PROVISIONS

SECTION 10.1. RELATIONSHIP OF THE PARTIES.

(A) Generally. The Independent Certifier is an independent contractor of the MBTA and the Systems Integrator and the relationship between the parties shall be limited to performance of this Agreement in accordance with its terms. No party shall have any responsibility with respect to the services to be provided or contractual benefits assumed by any other party.

(B) No Partnership or Employment Relationship. The Independent Certifier, its officers, employees, representatives and agents and any other persons engaged by the Independent Certifier in the performance of the Services will not by virtue of this Agreement or the performance of the Services become a partner, agent, legal representative or employee of either the MBTA and the Systems Integrator for any purpose.

(C) Independent Certifier Employees. The Independent Certifier will be responsible for all matters requisite as employer or otherwise in relation to such officers, employees, servants and agents and other persons who are engaged by the Independent Certifier. No liability or benefits, such as workers compensation, pension rights or liabilities, or other provisions or liabilities arising out of or related to a contract for hire or employer/employee relationship shall arise or accrue to the MBTA or the Systems Integrator as a result of this Agreement or the performance thereof.

SECTION 10.2. INDEPENDENT CERTIFIER PERSONS.

The Independent Certifier shall, as between itself and the MBTA and the Systems Integrator, be responsible for, and not relieved of its Independent Certifier obligations hereunder by, the acts, omissions, breaches, defaults, non-compliance, negligence and willful misconduct of any of its directors, officers, employees, agents, Subcontractors, representatives, or advisors (each an “Independent Certifier Person”), and all references in this Agreement to any act, omission, breach, default, non-compliance, negligence or willful misconduct of the Independent Certifier shall be construed accordingly to include any such act, omission, breach, default, non-compliance, negligence or willful misconduct committed by an Independent Certifier Person.

SECTION 10.3. GENERAL INDEPENDENT CERTIFIER ASSUMPTION OF RISK.

Except to the extent expressly allocated to the MBTA or the Systems Integrator or otherwise provided for under this Agreement, all risks, costs and expenses in relation to the performance by the Independent Certifier of its obligations under this Agreement are allocated to, and accepted by, the Independent Certifier as its entire and exclusive responsibility.

SECTION 10.4. WAIVER.

Failure by the MBTA, the Systems Integrator or the Independent Certifier to enforce a provision of this Agreement shall not be construed as a waiver by that party of any right with respect to that provision, or any other provisions of this Agreement.

SECTION 10.5. NOTICES.

Whenever under the provisions of this Agreement it will be necessary or desirable for one party to serve any approval, notice, request, demand, report or other communication on another party, all notices and other communications provided for hereunder or thereunder shall be given or made in writing (including, without limitation, by facsimile or other electronic transmission) delivered to the intended recipient at the address specified below or, as to any party, at such other address as shall be designated by such party in a notice to each other party. Except as otherwise provided in this Agreement, all such communications shall be deemed to have been duly given when transmitted by facsimile or other electronic transmission or personally delivered or, in the case of a mailed notice, upon receipt, in each case given or addressed as aforesaid. Any notice or other communication delivered by email to the Collateral Agent must be contained in a scanned or imaged attachment (such as .pdf or similar widely used format).

if to the MBTA:

if to the Independent Certifier:

if to the Systems Integrator:

or to such other address as any party may, from time to time, designate in the manner set forth above.

SECTION 10.6. TRANSFER AND ASSIGNMENT.

(A) Independent Certifier Actions. The Independent Certifier:

(1) shall not assign, transfer, mortgage, charge or encumber any right or obligation under this Agreement without the prior written consent of the MBTA and the Systems Integrator, which either the MBTA or the Systems Integrator may give or withhold in their absolute discretion; and

(2) agrees that any assignment, transfer, mortgage, charge or encumbrance will not operate to release or discharge the Independent Certifier from any obligation or liability under this Agreement.

(B) Change in Control of Independent Certifier. For the purposes of this Section, an assignment will be deemed to have occurred where there is a change in control of the Independent Certifier after the date of this Agreement.

(C) MBTA and Systems Integrator Actions. The MBTA and the Systems Integrator may assign, transfer, mortgage, charge or encumber any right or obligation under this Agreement in accordance with the terms of the Project Agreement.

SECTION 10.7. CONFIDENTIALITY.

(A) Independent Certifier Responsibilities. The Independent Certifier will ensure that:

(1) neither it nor any of its officers, employees, servants and agents disclose, or otherwise make public, any Project Material or any other information or material acquired in connection with or during the performance of the Services without prior written approval of the MBTA and the Systems Integrator; and

(2) no Project Material is used, copied, supplied or reproduced for any purpose other than for the performance of the Services under this Agreement.

(B) Confidentiality Agreements. The MBTA and the Systems Integrator may at any time require the Independent Certifier to give and to arrange for its officers, employees, servants and agents engaged in the performance of the Services to give written undertakings, in the form of confidentiality agreements on terms required by the MBTA and the Systems Integrator, relating to the non-disclosure of confidential information, in which case the Independent Certifier will promptly arrange for such agreements to be executed and delivered.

SECTION 10.8. PROJECT MATERIAL.

(A) Rights. The MBTA, the Systems Integrator and the Independent Certifier agree that the Independent Certifier does not and will not have any rights, including any intellectual property, in any Project Material provided to the Independent Certifier or created or required to be created by either the MBTA or the Systems Integrator.

(B) Title. All title and ownership, including all intellectual property, in and to the Project Material created or required to be created by the Independent Certifier as part of, or for the purposes of performing the Services, is hereby assigned jointly to the MBTA and the Systems Integrator on creation, or where such title, ownership and intellectual property cannot be assigned before creation of the Project Material, it will be assigned to the MBTA and the Systems Integrator on creation. In addition, to the extent that there may be any copyright rights in such Project Material so created by the Independent Certifier, the Independent Certifier hereby waives all past, present and future moral rights therein and the

Independent Certifier will ensure that any agent or employee of Independent Certifier will have waived all such moral rights. The Independent Certifier shall do all such things and execute all such documents as reasonably requested by either of the MBTA and the Systems Integrator in order to confirm or perfect the assignment of Intellectual Property in the Project Material referred to in this subsection.

SECTION 10.9. TIME OF THE ESSENCE.

Time will be of the essence of this Agreement and of the transactions contemplated by this Agreement.

SECTION 10.10. AMENDMENT.

No change or modification of this Agreement will be valid unless it is in writing and signed by each party to this Agreement.

SECTION 10.11. BINDING EFFECT.

Subject to the restrictions on transfer contained in this Agreement, this Agreement shall inure to the benefit of and shall be binding on the MBTA, the Systems Integrator and the Independent Certifier and their respective heirs, executors, administrators, successors and assigns.

SECTION 1.12. REPRESENTATIONS AND WARRANTIES OF THE INDEPENDENT CERTIFIER.

(A) Representations and Warranties. The Independent Certifier warrants that:

(1) Compliance with Applicable Law Generally. The Independent Certifier is in compliance in all material respects with applicable law and possesses the required license(s) pertaining to the Independent Certifier's business and services. The Independent Certifier certifies that it is listed under the Secretary of the Commonwealth's website as licensed to do business in the Commonwealth, as required by law.

(2) Collusion. The Independent Certifier certifies that this Agreement has been offered in good faith and without collusion, fraud or unfair trade practices with any other person, that any actions to avoid or frustrate fair and open competition are prohibited by law, and shall be grounds for termination of this Agreement.

(3) Debarment. The Independent Certifier certifies that it is not currently debarred or suspended by the federal or Commonwealth government under any law or regulation.

(4) Non-Discrimination. The Independent Certifier certifies compliance with all Commonwealth and federal laws and regulations, including the Federal Equal Employment Opportunity Laws, the Americans with Disabilities Act, and the Massachusetts Disability-Based Non-Discrimination Standards For Executive Branch Entities, and related standards and guidance authorized under Massachusetts Executive Order or any disability-based protection arising from state or federal law or precedent. Pursuant to Executive Orders 523, 524 and 526, the Independent Certifier shall not engage in unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

(5) Other Law Compliance. The Independent Certifier and any personnel performing Services are able to work legally in the United States and possess valid proof of work eligibility.

(B) Continuing Effect. During the term of this Agreement, the Independent Certifier shall not take any action, or omit to perform any act, that results in a representation and warranty made in this Section becoming untrue. The Independent Certifier shall promptly notify the MBTA if any such representation and warranty becomes untrue. From time to time, the Independent Certifier shall provide the MBTA, upon the MBTA's request, with proof of the continuing accuracy of these representations and warranties.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives on the day and year first above written.

[SIGNATURE PAGE TO BE DEVELOPED.]

APPENDIX 1

INDEPENDENT CERTIFIER PERSONNEL

The following personnel shall be involved in the performance of the Services:

[INSERT NAMES AND TITLES OF RELEVANT INDIVIDUALS]

APPENDIX 2

COMPENSATION AND PAYMENT OF INDEPENDENT CERTIFIER

1. Direct Labor Costs

The MBTA shall reimburse the Independent Certifier for the actual salaries paid by the Independent Certifier, not including salaries or other payments to partners or principals, unless otherwise specifically provided, for the time such employees are directly utilized in performing the Services. If it is the usual practice for partners or principals to perform certain basic technical work, they must be compensated for the time when they are actually engaged on the work, but only at a rate of pay commensurate with the type of work performed, provided that written approval is obtained from the MBTA prior to the use of said principals. Any administrative duties are categorized as an indirect expense, and partners and principals will not be paid for the performance of any administrative duties.

Actual direct salary costs, excluding costs of benefits, shall consist of payroll costs at straight time for the Independent Certifier and its technical employees (such as owners, partners, stockholders owning more than one percent of common stock outstanding, or other major supervisory personnel), excluding all principals or administrative officers, for the time such employees are directly engaged in performing the Services.

Premium Time or Overtime shall not be allowed under this Agreement without the express written approval of the MBTA.

It is understood that the current salary policy of the MBTA is to limit the hourly rate for Independent Certifier and technical employees to [\$70.00 per hour.] [NTD: MBTA to confirm that this is still correct.]

Salary rates paid to employees assigned to perform the Services required by this Agreement shall be commensurate with salaries paid to other employees of the Independent Certifier engaged in similar work.

The Independent Certifier and its technical employees shall, for purposes of submitting invoices to the MBTA, be categorized as regular employees of the Independent Certifier at an imputed direct salary rate commensurate with their qualifications and experience, not to exceed the maximum rate set forth above, plus markup for the approved overhead rate and fee.

Any increase in salary for the Independent Certifier's employees assigned to the Agreement will be the result of a company-wide evaluation of employees and shall be in accordance with company-wide personnel policies of the Independent Certifier, except that salary increases shall be limited to one per year, unless otherwise written approval has been obtained from the MBTA. The use of probation or trial periods of employment coupled with salary increase upon successful completion of such a period will not be allowed. Approval of salary increases shall be awarded no sooner than twelve months after either an individual's engagement in performing the Services required by this Agreement or the effective date of the individual's last salary increase, whichever is applicable.

Unless written approval is obtained from the MBTA, the salary increases in any twelve month period for all Independent Certifier employees performing the Services required by this Agreement shall not exceed a cumulative total of 4 percent.

Proposed promotions must include sufficient written justifications indicating increased responsibilities reflective of the proposed new title. The proposed salary level must be comparable to salaries of those in the same or similar job titles. The Independent Certifier must submit to the MBTA the detailed backup for

such an increase/promotion, and it shall not be allowed under this Agreement without the express written approval of the MBTA.

Promotions cannot be combined with merit increases.

The MBTA shall have the right to exercise the power of review and approval of salaries and increases thereto for a period up to sixty (60) calendar days following receipt of the Independent Certifier's written request of such rates or increases along with justification to ensure compliance with the above limitations. Such rates or increases shall not become effective until at least sixty (60) calendar days after such written request from the Independent Certifier is received by the MBTA.

Unless the MBTA notifies the Independent Certifier in writing during the sixty (60) calendar day period that such salary rate or increase is, in its opinion, unreasonable, such lack of notice shall constitute approval of the rate or increase from the proposed effective date. All salary changes from those submitted on the previous invoice shall be specifically noted by the Independent Certifier on its next invoice, giving the date of the letter requesting such increase. Changes in the salary rate(s) made prior to the date of such letter will not be approved for payment.

2. *Indirect Expenses*

The MBTA shall pay the Independent Certifier allowances for the indirect expenses of the home and branch offices of the Independent Certifier at a rate computed in accordance with the applicable cost principles of the Federal Acquisition Regulations, Part 31, in effect on the date of this agreement. The rate used for such computation shall be the audited rate established for the Independent Certifier by its cognizant U. S. Government Audit Agency, by other audit acceptable to the MBTA or based upon a final negotiated rate. Pending final determination of such rate on a fiscal year basis, a provisional rate shall be applied. The provisional rate to be applied during the first fiscal year and thereafter until the audited rate is determined for the first fiscal year is set forth in Exhibit "A". The audited rate for the first fiscal year shall apply as the provisional rate for the second fiscal year, and this procedure shall be followed for the duration of the services. The total maximum percentage of all indirect costs allowed under this Agreement shall be limited to a maximum of 155 percent, unless otherwise approved by the MBTA. If a new, higher, maximum overhead rate is allowed during the life of this Agreement, it shall be applicable to Amendments negotiated after the effective date of the new overhead limit. Said limit on allowable indirect costs shall apply notwithstanding any audit which indicates that higher indirect costs were actually incurred.

The Independent Certifier shall submit to the MBTA the Independent Certifier's most recent audited overhead rate on a bi-annual basis (January 1st and July 1st of each year) for the duration of the Agreement.

If the Independent Certifier does not have an audited overhead rate in accordance with the Federal Acquisition Regulations by a Certified Public Accountant annually, the Independent Certifier overhead rate shall be capped at 100% for the year lacking an audited overhead rate.

3. *Direct Expenses*

The Direct Expenses may include but not be limited to:

- a. Travel subsistence;

- b. All air travel which shall be approved by the MBTA and which shall be coach or economy class;
- c. Reimbursable travel expenses which shall include the actual cost of commercial transportation (e.g., taxi, bus, rail, and rental automobiles) required to perform the Services away from the employee's base office or location;
- d. Other reasonable Agreement related costs incurred by the Independent Certifier in connection with the Services and with prior written approval of the MBTA;
- e. Actual reasonable expenses of lodging and meals which shall be paid beginning with the day of departure from and ending with the day of return to the base office or location to which the employee is assigned. Incidental expenses shall be paid for necessary and usual personal travel expense items. Receipted expenses shall not exceed the per diem rates as set by the U.S. General Services Administration. www.GSA.gov/portal/category/21287

The cost of operating an employee's privately owned automobile, if authorized, will be reimbursed in accordance with the present Independent Certifier company policy, but limited to the standard mileage rate as set by the Internal Revenue Service. Parking fees, tolls, and other charges will be reimbursed on actual cost, receipted basis.

4. *Payments*

The Independent Certifier shall submit its invoices to the MBTA on a monthly basis. Each invoice shall contain the following information, as applicable:

- a. Copies of payroll data submitted by the Independent Certifier shall include the name, classification, dates and hours of Independent Certifier and technical personnel labor incurred that were directly employed on the project. If overtime work is required to maintain the desired time schedule, the overhead factor shall apply to the straight time portion of the premium time rate;
- b. a progress monitoring report with each invoice; and
- c. Total costs accumulated to date by individual Agreement element (i.e. - Base Agreement and each Amendment).

5. *Right to Audit*

All costs and expenses described in this Attachment are to be determined by actual records kept by the Independent Certifier in accordance with the provisions of this Agreement and are subject to final audit by the MBTA (or its designee). The total partial payments made hereunder shall be adjusted to conform to determinations made in such audit(s). Payments made to the Independent Certifier shall be subject to adjustments on the basis of audit by the MBTA. At its discretion, the MBTA may undertake interim audits and make retroactive interim payment adjustments as a result of such audits at any time during the term of this Agreement.

The Independent Certifier is obligated to maintain in an acceptable form, books, records, and other compilations of data pertaining to the performance of the provisions and requirements of this Agreement to the extent and in such detail as shall properly substantiate claims for payment under this Agreement, including complete employee time and payroll records, as well as documents, papers, and other evidence pertaining to billings to the MBTA under this Agreement.

The Independent Certifier shall make such materials available at its office at reasonable times during the term of this Agreement and thereafter for inspection by the various agencies and entities identified in this Section; and copies of such materials shall be furnished upon request of the MBTA or its designee.

All of the Independent Certifier's records noted above shall be kept for a minimum period of three (3) years after the date of final payment to the Independent Certifier by the MBTA as pertains to this Agreement or until the resolution of any litigation, claim, negotiation, audit or other action involving the records which arise at any time during the retention period, whichever is later. All document retention periods start on the first day after final payment under this Agreement. If any litigation, claim negotiation, audit or other action involving the records has been started before the expiration of the applicable retention period, all records shall be retained until completion of the action and resolution of all issues resulting therefrom, or until the end of the applicable retention period, whichever is later.

Upon the MBTA's request, the Independent Certifier shall provide the MBTA with copies of records in computer-readable format as well as hard copy, if the requested information exists in computer readable format.

The MBTA reserves the right to audit any other supporting evidence necessary to substantiate charges related to the Agreement (both direct and indirect costs, including overhead allocations as they may apply to costs associated with the Agreement).

The MBTA reserves the right to audit any of the Independent Certifier's records necessary to permit evaluation and verification of (a) the Independent Certifier's compliance with the requirements of this Agreement, (b) compliance with the owner's business ethics policies, and (c) compliance with provisions for pricing change orders, payments, or claims submitted by the Independent Certifier's or any of his payees.

The MBTA reserves the right to interview any of the Independent Certifier's current and former employees during the audit.

6. *MBTA's Right to Withhold Payment*

The MBTA may withhold payment to such extent as it deems necessary including, but not limited to, the reasons noted below:

- a. Proven Third-party claims arising out of the services under the Agreement which are made against the MBTA;
- b. Evidence of fraud, overbilling or overpayment discovered upon audit; or
- c. Unsatisfactory performance of the Services under the Agreement by the Independent Certifier;
- d. An MBTA determination that concludes that the Independent Certifier has been overpaid; and
- e. Noncompliance with Section 29 of the MBTA's Article II, General Provisions.

Prior to withholding payment, the MBTA shall notify the Independent Certifier in writing, and allow the Independent Certifier a reasonable amount of time to satisfactorily address and cure the stated reason for withholding of payment.

Any delay or postponement of payments among the parties may take place only for good cause and only with prior written approval from the MBTA.

7. *Disputed Items*

The MBTA will use its best efforts to raise questions and identify disputed items with respect to invoiced amounts without delaying the invoice payment process described above. If the Independent Certifier is not able to provide adequate additional information within five Business Days of a request by the MBTA, the MBTA may reject any individual item and delete it from payment in the current invoice. The Independent Certifier may resubmit the rejected item to the MBTA in a subsequent invoice with appropriate supporting material.

FORM OF SI COUNSEL LEGAL OPINION

for

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES

Dated

[_____, 2017]

FORM OF SI COUNSEL LEGAL OPINION

[Letterhead of SI Counsel]

_____, 2017

The Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

Automated Fare Collections System Project

Ladies and Gentlemen:

We have acted as special counsel to the [Systems Integrator] (the “Systems Integrator”) in connection with the execution and delivery of the Project Agreement, dated as of [_____, 2017] (the “Project Agreement”), by and between the Massachusetts Bay Transportation Authority (the “MBTA”) and the Systems Integrator.

In our capacity as special counsel to the Systems Integrator, we have examined the following:

- 1) The Project Agreement;
- 2) The Form of Project Contract, dated as of [_____, 2017] (the “Project Contract”), by and between the Systems Integrator and [Project Contractor] (the “Project Contractor”);
- 3) The Form of Material Contract Direct Agreement, dated as of [_____, 2017] (the “Material Contract Direct Agreement”), by and between the MBTA, the [Guarantor] (the “Guarantor”), the Systems Integrator and [the Material Contract Party] (the “Material Contract Party”); and
- 4) The Form of Guaranty Agreement, dated as of [_____, 2017] (the “Guaranty Agreement”), by and between the MBTA and [Guarantor] (the “Guarantor”).

The documents referred to in (1) through (4), together, are referred to in this Opinion Letter as the “SI Opinion Documents.”

In addition, we have reviewed such other documents and certificates of officers and representatives of the Systems Integrator, and have given consideration to such matters of law and fact, as we have deemed appropriate, in our professional judgment, to render this opinion.

Insofar as an opinion relates “to our knowledge” or similar language appears, such reference is based upon (i) the certificates and documents expressly referred to herein, and (ii) actual knowledge of the attorneys in this firm who have, as attorneys, devoted substantive attention to the transactions contemplated by the SI Opinion Documents.

In reaching the opinions set forth below, we have assumed, with your consent, the following:

- 1) Each of the parties to the SI Opinion Documents, other than the Systems Integrator, has duly and validly executed and delivered each such instrument, document and agreement to be executed in connection with the transactions contemplated by the SI Opinion Documents to which such party is a signatory, and such party’s obligations set forth in the SI Opinion Documents are its legal, valid and binding obligations, enforceable in accordance with their respective terms.
- 2) Each person, other than those on behalf of the Systems Integrator, executing the SI Opinion Documents, whether individually or on behalf of an entity, is duly authorized to do so.
- 3) Each natural person executing the SI Opinion Documents is legally competent to do so.
- 4) All signatures on the SI Opinion Documents (other than the Systems Integrator’s signatures) and on all other documents and records are genuine.
- 5) All records and documents submitted to us as originals are authentic and have not been amended, terminated or revoked, all documents and records submitted to us as certified or photostatic copies conform to the original documents.
- 6) The SI Opinion Documents have not been amended, modified or supplemented by any other agreement or understanding of the parties or waiver of any of the material provisions of the SI Opinion Documents.
- 7) Each other party to any of the SI Opinion Documents has been duly organized, and is validly existing under the laws of the state of its organization, and is duly qualified to do business in the Commonwealth of Massachusetts (the “Commonwealth”).

To the extent any of the above assumptions relate solely to the Systems Integrator, although we have not conducted an independent investigation of the accuracy or reasonableness of assumptions set forth in paragraphs (1) through (7) above, nothing is actually known by the attorneys within our firm who have been directly involved in representing the Systems Integrator in connection with the transactions contemplated by the SI Opinion Documents that leads them to question the accuracy of such matters.

We have relied on the representations of the MBTA in the Project Agreement. We have further assumed, without independent investigation, that each party (other than the Systems Integrator) to any of the SI Opinion Documents will perform each of the SI Opinion Documents to which it is a party in good faith and will act reasonably in exercising any discretion thereunder.

To the extent that this opinion deals with the application of law, it is limited as to the effect on the subject transaction only of the laws of the United States of America and the Commonwealth, and we express no opinion with respect to the applicability thereto, or the effect thereon, of the laws of any other jurisdiction or of principles of conflicts of laws.

Based upon the foregoing and subject to the limitations, qualifications, exceptions and assumptions set forth herein, we are of the opinion that:

- a) The Systems Integrator has the legal power, right and authority to execute, deliver and perform the SI Opinion Documents, subject to the terms and conditions of each such document.
- b) The Systems Integrator has duly authorized by all necessary action the execution, delivery and performance of, and have duly and validly executed and delivered, the SI Opinion Documents to which each is a party.
- c) Neither (i) the authorization, execution or delivery by the Systems Integrator of the SI Opinion Documents, (ii) the performance by the Systems Integrator of its obligations under the SI Opinion Documents, nor (iii) the consummation by the Systems Integrator of the transactions contemplated in the SI Opinion Documents will violate or contravene any law, rule or regulation applicable to the Systems Integrator.
- d) No approval, consent, authorization or other action by, or filing with, any court or any agency or authority of the United States of America or the Commonwealth is required in connection with the execution and delivery by the Systems Integrator of the SI Opinion Documents or the performance by the Systems Integrator of its obligations under the SI Opinion Documents.

The opinions set forth above are subject to the following additional assumptions, qualifications and exceptions:

- a) The opinions expressed herein are subject to: applicable bankruptcy, avoidance, insolvency, reorganization, moratorium and other similar laws affecting the rights of creditors generally, including statutory and other laws relating to fraudulent conveyances or transfers and preferential transfers; and general principles of equity (whether applied by a court of law or of equity). Moreover, the exercise or enforcement of the rights and remedies under the SI Opinion Documents could be subject to limitation if (i) the enforcement of such rights and remedies is not reasonably necessary for the protection of the MBTA or the Collateral Agent, (ii) the penalties imposed bear no reasonable relation to the damages suffered by the MBTA or the Collateral Agent, (iii) the enforcement of the rights and remedies violates the obligations of the Collateral Agent, or (iv) the Systems Integrator Events of Default or MBTA Events of Default are deemed by a court not to be material. Furthermore, no opinion is expressed as to (1) whether any provisions of any of the SI Opinion Documents are enforceable by means of specific performance or (2) the enforceability of any indemnification or contribution provision, which provisions may be unenforceable or limited by federal or Commonwealth laws or public policy.

This opinion is limited to the matters set forth herein, and no opinion is implied or may be inferred beyond the matters expressly stated. This opinion is for your sole benefit and may not be used or relied on by any other person or entity without our prior written consent. This opinion is furnished by us as counsel for the Systems Integrator solely for the purposes contemplated by the Project Agreement. The opinions expressed herein may be relied upon only in connection with the transactions contemplated by the Project Agreement.

Very truly yours,

FORM OF MBTA COUNSEL LEGAL OPINION
TO BE DELIVERED AT FINANCIAL CLOSE

for

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES

Dated

[_____, 2017]

FORM OF MBTA COUNSEL LEGAL OPINION
TO BE DELIVERED AT FINANCIAL CLOSE

[Letterhead of Prince Lobel Tye LLP]

_____, 2017

The Massachusetts Bay Transportation Authority
10 Park Plaza
Boston, MA 02116

RE: Automated Fare Collections System Project

Ladies and Gentlemen:

We have acted as local counsel to the Massachusetts Bay Transportation Authority (the “MBTA”) in connection with the execution and delivery of the following agreements:

- 1) The Project Agreement, dated as of [_____, 2017] (the “Project Agreement”), by and between the MBTA and [Systems Integrator] (the “Systems Integrator”);
- 2) The Design-Build Contract, dated as of [_____, 2017] (the “DB Contract”), by and between the MBTA and [DB Entity] (the “DB Entity”);
- 3) The Material Contract Direct Agreement, dated as of [_____, 2017] (the “Material Contract Direct Agreement”), by and between the MBTA, the [Guarantor] (the “Guarantor”), the Systems Integrator and [the Material Contract Party] (the “Material Contract Party”), and
- 4) The Lenders’ Remedies Agreement dated as of [_____, 2017] (the “Lenders’ Remedies Agreement”), by and between the MBTA, the [Guarantor] (the “Guarantor”), the Systems Integrator and [Collateral Agent] (the “Collateral Agent”).

The documents referred to in (1) through (4), together, are referred to in this Opinion Letter as the “MBTA Opinion Documents.”

In our capacity as local counsel to the MBTA, we have examined the following:

- 1) The MBTA Opinion Documents;

The Massachusetts Bay Transportation Authority

_____, 2017

Page 2 of 7

- 2) A copy of resolutions adopted by the Directors of the MBTA, dated as of _____, authorizing, *inter alia*, the execution and delivery of the MBTA Opinion Documents certified as true and correct as of the date hereof, by _____
- 3) Certificates of state officials; and
- 4) Certificates of MBTA.

The documents referred to in (2) through (4), together, are referred to in this Opinion Letter as the “Certificates.”

We have also examined the following:

- 1) Originals or copies, certified or otherwise identified to our satisfaction, of such other documents, public records and other instruments and have conducted such other investigations as we have deemed necessary for the purposes of this Opinion Letter; and
- 2) Such other matters, statutes, published rules and regulations, published judicial and governmental decisions interpreting or applying the same, and other official interpretations as we deem applicable in connection with this opinion.

Insofar as an opinion relates “to our knowledge” or similar language appears, such reference is based upon (i) the certificates and documents expressly referred to herein, and (ii) actual knowledge of the attorneys in this firm who have, as attorneys, devoted substantive attention to the transactions contemplated by the MBTA Opinion Documents without any special or additional inquiry or investigation undertaken for the purposes of this Opinion Letter.

With respect to all matters of fact (including factual conclusions and characterizations and descriptions of purpose, intention, or other state of mind), we have relied upon the Certificates and the representations of the several parties set forth in the MBTA Opinion Documents, and have assumed, with your permission and without independent inquiry or investigation, the accuracy of those representations.

In rendering our opinion, we have not conducted any investigation into the manner in which the MBTA conducts its business. Accordingly, our opinions with respect to the laws of the Commonwealth of Massachusetts (the “Commonwealth”) and the federal laws of the United States are expressly limited to laws or governmental regulations of general applicability to the Commonwealth, as in effect on the date of this Opinion Letter. Insofar as such laws are applicable to and affect the MBTA, and inasmuch as we have not conducted any investigation with respect to the MBTA’s compliance with laws of particular applicability, we are, therefore, not expressing any opinion concerning laws of particular applicability, including without limitation, environmental laws, rules and regulations; laws, rules and regulations concerning confidentiality or data privacy; securities laws and regulations; laws, rules and regulations

The Massachusetts Bay Transportation Authority

_____, 2017

Page 3 of 7

regarding intellectual property and infringements thereof; municipal ordinances, zoning rules and regulations; building codes and regulations (including those related to access for persons with disabilities); and applicable municipal or quasi-municipal licenses, permits and approvals.

In reaching the opinions set forth below, we have assumed, with your consent, the following:

- 1) Each of the parties to the MBTA Opinion Documents, other than the MBTA, has duly and validly executed and delivered each such instrument, document and agreement to be executed in connection with the transactions contemplated by the MBTA Opinion Documents to which such party is a signatory, and such party's obligations set forth in the MBTA Opinion Documents are its continuing, legal, valid and binding obligations, enforceable in accordance with their respective terms.
- 2) Each person, other than the MBTA, executing the MBTA Opinion Documents, whether individually or on behalf of an entity, is duly authorized to do so.
- 3) Each natural person executing the MBTA Opinion Documents is legally competent to do so.
- 4) All signatures on the MBTA Opinion Documents and on all other documents and records are genuine.
- 5) All records and documents submitted to us as originals are authentic and have not been amended, terminated or revoked, all documents and records submitted to us as certified, electronic or photostatic copies conform to the original documents, and all public records and other information reviewed are accurate and complete.
- 6) The MBTA Opinion Documents have not been amended, modified or supplemented by any other agreement or understanding of the parties or waiver of any of the material provisions of the MBTA Opinion Documents.
- 7) Each other party to any of the MBTA Opinion Documents (other than the MBTA) has been duly organized, and is validly existing under the laws of the state of its organization, and is duly qualified to do business in the Commonwealth.

To the extent any of the above assumptions relate solely to the MBTA, although we have not conducted an independent investigation of the accuracy or reasonableness of assumptions set forth in paragraphs (1) through (7) above, nothing is actually known by the attorneys within our firm who have been directly involved in representing the MBTA in connection with the transactions contemplated by the MBTA Opinion Documents that leads them to question the accuracy of such matters.

The Massachusetts Bay Transportation Authority

_____, 2017

Page 4 of 7

We have relied on the representations of the several parties (other than those of the MBTA) set forth in each of the MBTA Opinion Documents. We have further assumed, without independent investigation, that each party (other than the MBTA) to any of the MBTA Opinion Documents will perform each of the MBTA Opinion Documents to which it is a party in full compliance with its terms and all applicable laws, in good faith and will act reasonably in exercising any discretion thereunder. To the extent that any opinion given herein addresses the future performance of the MBTA of its obligations under any MBTA Opinion Documents, we have assumed with your permission that in each such case that the MBTA will perform each of its obligations under the MBTA Opinion Documents in full compliance with all applicable laws.

To the extent that this opinion deals with the application of law, it is limited as to the effect on the subject transaction only of the laws of the United States of America and the Commonwealth, and we express no opinion with respect to the applicability thereto, or the effect thereon, of the laws of any other jurisdiction or of principles of conflicts of laws. No opinion is given herein with respect to: any provision requiring arbitration, any waiver of any statute of limitations or the choice of law or internal substantive rules of law that any tribunal may apply to the transactions contemplated by the MBTA Opinion Documents.

Based upon the foregoing and subject to the limitations, qualifications, exceptions and assumptions set forth herein, we are of the opinion that:

- a) The MBTA has the legal power, right and authority to execute, deliver and perform the MBTA Opinion Documents, subject to the terms and conditions of each such document.
- b) The MBTA has duly authorized by all necessary action the execution, delivery and performance of, and have duly and validly executed and delivered, the MBTA Opinion Documents to which it is a party.
- c) The authorization, execution or delivery by the MBTA of the MBTA Opinion Documents (i) did not violate or contravene any law, rule or regulation applicable to the MBTA, and (ii) the performance by the MBTA of its obligations under the MBTA Opinion Documents will not violate or contravene any law, rule or regulation applicable to the MBTA.
- d) The MBTA Opinion Documents constitute a legal, valid and binding obligation of the MBTA enforceable against the MBTA in accordance with their respective terms.
- e) No approval, consent, authorization or other action by, or filing with, any court or any agency or authority of the United States of America or the Commonwealth is required in connection with the execution and delivery by the MBTA of the MBTA Opinion Documents or the performance by the MBTA of its obligations under the MBTA Opinion Documents, except to the extent that actions of the Board of Directors of the MBTA have

The Massachusetts Bay Transportation Authority

_____, 2017

Page 5 of 7

been required to approve the MBTA Opinion Documents, and may be required to approve any other agreements or understandings arising out of the Project Agreement.

The opinions set forth above are subject to the following additional assumptions, qualifications and exceptions:

- a) The opinions expressed herein are subject to: applicable bankruptcy, avoidance, insolvency, reorganization, moratorium and other similar laws affecting the rights of creditors generally, including statutory and other laws relating to fraudulent conveyances or transfers and preferential transfers; and general principles of equity including, without limitation, concepts of materiality and reasonableness (whether applied by a court of law or of equity).
- b) The exercise or enforcement of the rights and remedies by the several parties under the MBTA Opinion Documents could be subject to limitation if (i) the enforcement of such rights and remedies is not reasonably necessary for the protection of the damaged party, (ii) the penalties imposed bear no reasonable relation to the damages suffered by the damaged party, or (iii) the Systems Integrator Events of Default or MBTA Events of Default are deemed by a court not to be material.
- c) No opinion is expressed as to (1) whether any provisions of any of the MBTA Opinion Documents are enforceable by means of specific performance or other equitable relief or (2) the enforceability of any (a) waivers of rights to object to jurisdiction or venue, (b) waiver of rights to (or methods of) service of process, or rights to trial by jury, or other rights or benefits bestowed by operation of law, (c) waivers of any applicable defenses, setoffs, recoupments, or counterclaims, (d) grant of powers of attorney to any party, (e) exculpation or exoneration clauses, indemnity clauses, and clauses relating to releases or waivers of unmaturing or unknown claims or rights under the MBTA Opinion Documents, or (f) indemnification or contribution provision, which provisions may be unenforceable or limited by federal or Commonwealth laws or public policy.

This letter is provided to you as a legal opinion only, and not as a guaranty or warranty of the matters discussed herein. Accordingly, this opinion is not a guaranty of the outcome a court would reach, but an opinion of the outcome a court would reach in the future in a properly presented and competently argued case.

Our opinion is based only on the laws in effect as of this date, and there are no additional facts of which we are aware at this time which would materially affect the validity of the assumptions and conclusions set forth herein or upon which these opinions are based. We assume no obligation to advise you of any changes which may later be brought to our attention.

This letter is being furnished only to MBTA for the use of MBTA only, and is not to be disseminated, reproduced or published in any form, used for any purpose or relied upon any

The Massachusetts Bay Transportation Authority

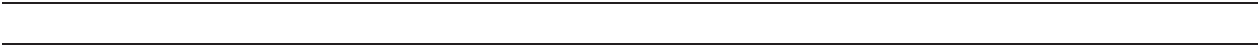
_____, 2017

Page 6 of 7

other person or entity without our prior written consent. Notwithstanding the foregoing, (i) this opinion may be relied upon by _____ in connection with the placement _____.

Very truly yours,

Prince Lobel Tye LLP



NON-DISCLOSURE AGREEMENT

for

AUTOMATED FARE COLLECTIONS SYSTEM SERVICES

between

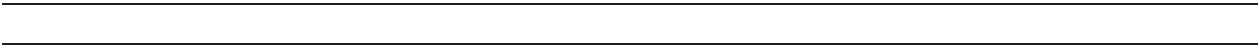
THE MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

and

[CONTRACTOR]

Dated

[_____, 2017]



NON-DISCLOSURE AGREEMENT

This Non-Disclosure Agreement (the “Agreement”) is dated [_____] (the “Effective Date”) and made between Massachusetts Bay Transportation Authority, a body politic and corporate and a political subdivision of the Commonwealth of Massachusetts with a principal place of business at 10 Park Plaza, Boston, Massachusetts (the “MBTA”), and [_____] organized and existing under the laws of [STATE], with an office at [_____] (the “Contractor”) (each a “Party” and together the “Parties”).

WHEREAS, the MBTA is a political subdivision of the Commonwealth of Massachusetts (the “Commonwealth”), established under the provisions of M.G.L. c. 161A, and is responsible for providing public transportation services in certain areas of the Commonwealth;

WHEREAS, the MBTA has entered into an agreement with [_____] (the “Systems Integrator”) to implement a new automated, account-based open fare collections system (the “System”) to serve the MBTA’s transportation network;

WHEREAS, the MBTA and the Contractor have entered into a separate agreement under which the Contractor will provide the MBTA with certain services (the “Services”);

WHEREAS, in connection with the provision of the Services, the MBTA may provide the Contractor with certain Confidential Information (as that term is defined below);

WHEREAS, it is an explicit condition to the disclosure of Confidential Information to the Contractor that the Contractor treats all such Confidential Information in strict compliance with this Agreement; and

WHEREAS, the Parties intend that this Agreement will augment the relationship between the MBTA and the Contractor;

NOW THEREFORE, the Parties agree to the following:

SECTION 1. FURTHER DEFINITIONS.

The following capitalized terms have the meanings set forth below. Other capitalized terms are defined in context.

“Confidential Information” means Information of the MBTA (including Third Party Information) provided to or accessed by the Contractor that meets either of the following criteria: the Information (i) is identified by a “CONFIDENTIAL” legend or similar legend of the MBTA, or (ii) that by the nature of the circumstances surrounding disclosure, or the nature of the Information itself, should in good faith be treated as confidential.

“Information” means disclosures in written, oral, electronic, or other tangible or intangible forms, which is provided directly by the MBTA to the Contractor prior to or during the Term, including without limitation inventions, specifications, customer and client lists, other customer and client information, research, processes and procedures, drawings, sketches, models, samples, reports, plans, financial information, work-in-progress, forecasts, current or historical data, computer programs or documentation and all other technical, financial, intellectual or business information or data.

“**Third Party**” means any person or entity other than the MBTA, the Contractor, or the affiliates of either Party. By way of example, not limitation, the Systems Integrator shall be considered a Third Party under this Agreement.

“**Third Party Information**” means Information provided by any Third Party to the MBTA.

SECTION 2. CONFIDENTIALITY OBLIGATIONS.

Subject to Section 3 (Exceptions), the Contractor shall:

- (1) keep Confidential Information confidential and secret, using at least the same degree of care the Contractor uses with Confidential Information of its own, but in no event less than reasonable care;
- (2) use such Confidential Information only for purposes of providing the Services and for no other purpose;
- (3) restrict disclosure of Confidential Information solely to its affiliates and employees with a need to know such Confidential Information in connection with the limited purposes of this Agreement;
- (4) comply with all other obligations and restrictions imposed by the MBTA on the Contractor with respect to Confidential Information (including those obligations imposed on the MBTA by Third Parties); and
- (5) ensure that all of the Contractor’s employees (if any) with such access to the Confidential Information comply with the obligations of confidentiality and non-use established pursuant to this Agreement.

SECTION 3. EXCEPTIONS.

Except for Confidential Information that consists of or otherwise contains Third Party Information, for which there shall be no exception, the Contractor’s obligations of confidentiality and non-use shall not apply where the Contractor shows (with the burden of such a showing placed on the Contractor) that the Information (that would otherwise qualify as Confidential Information):

- (1) is, or after the Effective Date becomes part of, the public domain through no wrongful act, fault, or negligence on the part of the Contractor;
- (2) was in the possession of the Contractor at the time of the Contractor’s receipt of the Confidential Information, and was not otherwise subject to an existing agreement of confidentiality;
- (3) is received by the Contractor from a Third Party without restriction and without breach of any obligation of confidentiality to the MBTA;
- (4) was independently developed by the Contractor without reliance on Confidential Information or any derivatives of such Confidential Information, as evidenced by the Contractor’s written records kept in the ordinary course of the Contractor’s business; or

(5) is required to be disclosed by the Contractor pursuant to a valid order or subpoena of a court or other governmental body or any political subdivision thereof (each, an "Order"); provided, however, that the Contractor shall (i) give timely notice to the MBTA of the Order; (ii) permit the MBTA to interpose an objection to the Order (each, an "Objection"); (iii) provide reasonable assistance to the MBTA with respect to such Objection (at the MBTA's expense); and (iv) thereafter disclose only such Confidential Information as necessary to comply with the Order (as originally issued or as modified by the Objection).

SECTION 4. THIRD PARTY BENEFICIARY RIGHTS.

The Contractor agrees that if the MBTA discloses any Third Party Information to the Contractor, then the Third Party who provided such information to the MBTA shall be considered a third party beneficiary of this Agreement (each, a "Third Party Beneficiary"). The Contractor further agrees that such Third Party Beneficiary shall be entitled to directly enforce the provisions under this Agreement against the Contractor as if such Third Party Beneficiary were a signatory to this Agreement.

SECTION 5. NO IMPLIED LICENSES; OWNERSHIP.

Nothing contained in this Agreement shall be construed as a grant of rights or any license by the MBTA to the Contractor in any Confidential Information, except as expressly set out herein, and there shall be no implied rights pursuant to this Agreement, based on any course of conduct or other construction or interpretation thereof. All rights and licenses not expressly granted herein are reserved. The Contractor agrees that, as between the Parties, all Confidential Information shall remain the property of the MBTA. The Parties do not intend this provision to govern express licenses, express assignments, or other express dispositions of intellectual property set out in other agreements they have entered or might choose to enter.

SECTION 6. NO OBLIGATION TO PROVIDE INFORMATION.

Nothing contained in this Agreement obligates the MBTA to disclose any Confidential Information to the Contractor.

SECTION 7. DISCLAIMER.

The Parties agree that no representations or warranties whatsoever are being made concerning the accuracy, completeness or correctness of any Confidential Information, and no such representation or warranty is implied. THE MBTA EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT.

SECTION 8. TERM AND TERMINATION.

This Agreement shall commence on the Effective Date and shall continue in full force and effect until terminated pursuant to this Section 8 (Term and Termination) (the "Term"). The MBTA shall be entitled to terminate this Agreement for any reason upon ten days written notice to the Contractor of its intent to terminate this Agreement.

SECTION 9. DEFEND TRADE SECRETS ACT OF 2016 NOTICE.

Notice is hereby given pursuant to 18 U.S.C. § 1833(b)(3)(A) as follows: (i) an individual shall not be held criminally or civilly liable under any federal or state trade secret law for the disclosure of a trade secret that: (a) is made both (1) in confidence to a federal, state or local government official, either directly or indirectly, or to an attorney, and (2) solely for the purpose of reporting or investigating a suspected violation of law; or (b) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal, and (ii) an individual who files a lawsuit for retaliation by an employer for reporting a suspected violation of law may disclose the trade secret to the attorney of the individual and use the trade secret information in the court proceeding, if the individual both (x) files any document containing the trade secret under seal, and (y) does not disclose the trade secret, except pursuant to court order.

SECTION 10. EFFECT OF TERMINATION.

(1) Return or Destruction of Information. Upon termination or expiration of this Agreement, the Contractor shall, at the MBTA's direction, either (i) return to the MBTA all of Confidential Information, including all documents and materials derived from such Confidential Information, or (ii) destroy all such Information and certify to such destruction in writing to the MBTA. The Parties acknowledge that the obligations set out in this Section 10.1 (Return or Destruction of Information) shall not apply to electronic copies of Confidential Information stored in the Contractor's backup or archival system that cannot reasonably be accessed (collectively, the "Archived Information"). The Contractor agrees (i) that it shall continue to protect Archived Information as required pursuant to this Agreement for as long as it retains the Archived Information, and (ii) that it shall destroy the Archived Information in compliance with its document retention and destruction policies.

(2) Confidentiality Obligations Continue. Subject to Section 3 (Exceptions), the Contractor's confidentiality and non-use obligations under this Agreement with respect to Confidential Information shall survive any termination or expiration of this Agreement.

(3) Survival. The following provisions shall survive any termination or expiration of this Agreement: (i) Section 2 (Confidentiality Obligations); (ii) Section 3 (Exceptions); (iii) Section 4 (No Implied Licenses; Ownership); (iv) Section 10 (Effect of Termination); (v) Section 11 (General); and (vi) any other term or provision of this Agreement that by its nature is intended to survive the termination or expiration of this Agreement.

SECTION 11. GENERAL.

(1) Binding Nature of Agreement. This Agreement is intended to benefit and shall be binding on the Parties and their successors and assigns.

(2) Press Releases; No Joint Venture. The Contractor shall not issue publicity releases, or make any other disclosure to any Third Party, regarding this Agreement or the Parties' relationship, except as may be required by law, in which case the Contractor shall give the MBTA maximum feasible notice of such disclosure. This Agreement is not intended to be, nor shall it be construed as, a joint venture, partnership, or other formal business organization.

(3) Waiver; Severability. No failure or delay by the MBTA hereto in exercising any right, power or privilege hereunder shall operate as a waiver thereof, nor shall any single or partial exercise thereof preclude any other or future exercise of any right, power or privilege. If

any provision of this Agreement is found to be unenforceable, the remainder shall be enforced as fully as possible and the unenforceable provision shall be deemed modified to the limited extent required to permit its enforcement in a manner most closely approximating the intention of the Parties as expressed herein.

(4) Non-Solicitation. For a period of two years after the termination or expiration of this Agreement, the Contractor shall not, without the written consent of the MBTA, solicit or cause to be solicited for employment, or employ, any person employed by the MBTA or its affiliates, provided that the Contractor shall not be prohibited from conducting generalized solicitations for employment not specifically targeted at the MBTA's employees or from hiring persons responding solely to those solicitations.

(5) Compliance with Laws; Export and Import Restrictions. Each Party shall comply with all applicable laws and regulations of governmental bodies and agencies in connection with its performance under this Agreement including, without limitation, United States export laws and regulations.

(6) Remedies. No remedy conferred by any of the provisions of this Agreement is intended to be exclusive of any other remedy, and each remedy is cumulative and in addition to every other remedy available to a Party hereunder or otherwise existing at law, in equity, by statute or otherwise. The election of any one or more remedies by either Party shall not constitute a waiver of the right to pursue other available remedies.

(7) Entire Agreement. This Agreement (and any other written agreement entered into between the Parties relating to the Contractor's provision of Services (collectively, the "Other Agreements")) constitutes the entire agreement between the Parties and supersedes any prior or contemporaneous oral or written representation with regard to the subject matter hereof. This Agreement may not be modified except in writing signed by both Parties. In the event of a conflict between any term or provision of this Agreement and any Other Agreement (if applicable), the term or provision of this Agreement shall control.

(8) Choice of Law; Jurisdiction. This Agreement shall be governed and construed in all respects in accordance with the laws of the Commonwealth of Massachusetts without regard to any conflict of laws principles. The exclusive venue and jurisdiction for any action or proceeding arising out of this Agreement shall be the state and federal courts located in City of Boston, County of Suffolk, Commonwealth of Massachusetts. The Parties accept the personal jurisdiction of such courts.

WHEREFORE, the Parties through their authorized agents have signed this Agreement as of the Effective Date.

[SIGNATURE PAGE TO BE DEVELOPED]

SCHEDULE F
MASTER SUBMITTALS LIST

PROPOSAL SUBMITTAL REQUIREMENTS

An excerpt of the Master Submittals List, showing the proposal Submittal requirements (PSRs) from the Technical Requirements.

Last updated: 28 June 2017

| Order in RFP | Order in Proposal | Submittal # | Description <small>Submittal name Section within the Submittal</small> | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|--|--------------|-----------|-----------------------------------|--|---|------------------|--|-----------------------|--------|
| 121 | 1 | PSR 29-1 | Accessibility and Language general approach | Appendix 2.9 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Accessibility and Language | x | x |
| 126 | 2 | PSR 29-4 | Accessibility compliance monitoring plan | Appendix 2.9 | 6.2 | Technical Proposal Submittal Date | Required | | Vol 2 | Accessibility and Language | x | x |
| 127 | 3 | PSR 29-4.1 | Accessibility compliance monitoring plan Plan for monitoring Accessibility during Installation, Pilots and Transition Period | Appendix 2.9 | 6.3.1 | Technical Proposal Submittal Date | Required | Part of the Accessibility compliance monitoring plan Submittal. | Vol 2 | Accessibility and Language | x | x |
| 122 | 4 | 1-2 | Proposal Form 2 Accessibility specialist name and qualifications | Appendix 2.9 | 2.5 | Technical Proposal Submittal Date | Required | Part of Proposal Form 2. | Vol 1 Pkg 1 | Accessibility and Language | x | x |
| 4 | 5 | PSR 23-2 | Proposed Gates | Appendix 2.3 | 2.2.1.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. Submittal will be evaluated in more than one topic. | Vol 2 | Accessibility and Language | x | x |
| 36 | 6 | PSR 23-2.3 | Proposed Gates Points of presentment on Accessible Gates | Appendix 2.3 | 5.1.5.1-4 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Accessibility and Language | x | x |
| 37 | 7 | PSR 23-2.4 | Proposed Gates Clearance width for any Gate that re-uses AFC 1.0 Gate enclosures | Appendix 2.3 | 5.2.1-1 | Technical Proposal Submittal Date | Only required if SI elects to reuse AFC 1.0 Gate enclosures. | Part of proposed Gates Submittal. | Vol 2 | Accessibility and Language | x | x |
| 38 | 8 | PSR 23-2.5 | Proposed Gates Clearance width for any Gate that does not re-use AFC 1.0 Gate enclosures | Appendix 2.3 | 5.2.1-2 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Accessibility and Language | x | x |
| 39 | 9 | PSR 23-2.6 | Proposed Gates Clearance width for Accessible Gates | Appendix 2.3 | 5.2.1-3 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Accessibility and Language | x | x |
| 40 | 10 | PSR 23-2.7 | Proposed Gates Proposed floor covering | Appendix 2.3 | 5.2.2-2 | Technical Proposal Submittal Date | Only required if the SI proposes to use a floor covering for Gates. | Part of proposed Gates Submittal. | Vol 2 | Accessibility and Language | x | x |
| 5 | 11 | PSR 23-3 | Proposed Fare Vending Machines | Appendix 2.3 | 2.2.1.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. Submittal will be evaluated in more than one topic. | Vol 2 | Accessibility and Language | x | x |
| 7 | 12 | PSR 23-4 | Proposed Validators | Appendix 2.3 | 2.2.1.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. Submittal will be evaluated in more than one topic. | Vol 2 | Accessibility and Language | x | x |
| 123 | 13 | PSR 29-2 | Gate configuration | Appendix 2.9 | 3.1.4.4 | Technical Proposal Submittal Date | Required | Same Submittal will be considered for multiple evaluation topics. | Vol 2 | Accessibility and Language | x | x |
| 125 | 14 | PSR 29-3 | Approach to address existing gate Accessibility issues | Appendix 2.9 | 3.2.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Accessibility and Language | x | x |
| 31 | 15 | PSR 23-9 | Hands free remote gate activation concept white paper | Appendix 2.3 | 4.1-10 | Technical Proposal Submittal Date | Required | | Vol 2 | Accessibility and Language | x | x |
| 128 | 16 | PSR 29-5 | Language capabilities Ability to implement additional languages | Appendix 2.9 | 7.4.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Accessibility and Language | x | x |
| 129 | 17 | PSR 29-5.1 | Language capabilities User Established Customizations | Appendix 2.9 | 7.5.3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Accessibility and Language | x | x |
| 130 | 18 | PSR Exp1 | Proposer Team experience: Accessibility and language | Appendix 2.9 | 8 | Technical Proposal Submittal Date | Required | | Vol 2 | Accessibility and Language | x | x |
| 75 | 19 | PSR 25-1 | Communications Networks general approach | Appendix 2.5 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 76 | 20 | PSR 25-2 | Explanation of System interface availability | Appendix 2.5 | 1.8.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 77 | 21 | PSR 25-3 | Verizon/ MBTA contract choice | Appendix 2.5 | 4.6.3 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | |
| 78 | 22 | PSR 25-4 | Conceptual network drawings | Appendix 2.5 | 4.10 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 80 | 23 | PSR 25-6 | Use of MBTA Layer 2 Services | Appendix 2.5 | 5.4 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | |
| 81 | 24 | PSR 25-6.1 | Use of MBTA Layer 2 Services Estimated network traffic | Appendix 2.5 | 5.5.2 | Technical Proposal Submittal Date | Only required if the SI elects to use MBTA Layer 2 Services. | | Vol 2 | System Capabilities and Information Security | x | |
| 82 | 25 | PSR 25-6.2 | Use of MBTA Layer 2 Services CN component requirements for Data Center | Appendix 2.5 | 5.6.3 | Technical Proposal Submittal Date | Only required if the SI elects to use MBTA Layer 2 Services. | | Vol 2 | System Capabilities and Information Security | x | |
| 204 | 26 | PSR 31-1 | Information Security and Integrity general approach | Appendix 3.1 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 205 | 27 | PSR 31-2 | Sample Information Security Plan | Appendix 3.1 | 1.6.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 206 | 28 | PSR 31-3 | Initial Risk Assessment | Appendix 3.1 | 2.1.3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 207 | 29 | 1-2 | Proposal Form 2 Qualified Security Assessor | Appendix 3.1 | 2.3.3.4 | Technical Proposal Submittal Date | Required | Part of Proposal Form 2. | Vol 1 Pkg 1 | System Capabilities and Information Security | x | x |
| 208 | 30 | PSR 31-4 | PCI-SSC certifications | Appendix 3.1 | 2.3.5.2 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 209 | 31 | PSR 31-5 | Collection and storage of PII Data | Appendix 3.1 | 2.5.2.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 210 | 32 | PSR 31-6 | Completed Cloud Security Alliance Consensus Agreement questionnaire | Appendix 3.1 | 2.6.2 | Technical Proposal Submittal Date | Only required if the system makes use of any Cloud Computing Services. | Must be completed for each Cloud Computing Service. | Vol 2 | System Capabilities and Information Security | x | x |
| 211 | 33 | PSR 31-7 | Approach to using encryption, tokenization, and hashing methods | Appendix 3.1 | 3.1.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|--|---------------|-----------|-----------------------------------|---|---|------------------|--|-----------------------|--------|
| 212 | 34 | PSR 31-8 | Explanation of key rollover capabilities | Appendix 3.1 | 3.1.3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 213 | 35 | PSR 31-9 | Certification Authority identification and process | Appendix 3.1 | 3.2.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 214 | 36 | PSR 31-10 | Scalability approach and limitations | Appendix 3.1 | 11.3.5 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 215 | 37 | PSR 31-11 | Contingency plan | Appendix 3.1 | 12 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 216 | 38 | PSR 31-12 | System composition | Appendix 3.1 | 16 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 283 | 39 | PSR 310-1 | External Interfaces general approach | Appendix 3.10 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 220 | 40 | PSR 31B-1 | Federated User Identity general approach | Appendix 3.1B | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 221 | 41 | PSR 31B-2 | Federated Identity Services solution | Appendix 3.1B | 1.1.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 222 | 42 | PSR 31B-3 | Federated Identity Services assurance level | Appendix 3.1B | 1.1.2.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 232 | 43 | PSR 23-6.2 | Time synchronization process Readers | Appendix 3.2 | 1.6.2.1.1 | Technical Proposal Submittal Date | Required | Part of the time synchronization process Submittal required by Appendix 2.3. | Vol 2 | System Capabilities and Information Security | x | x |
| 14 | 44 | PSR 23-6.1 | Time synchronization process Customer-Facing Devices | Appendix 2.3 | 3.2.4 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 258 | 45 | PSR 37-1 | Fare Policy and Fare Calculation general approach | Appendix 3.7 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 260 | 46 | PSR 37-2 | Capabilities and limitations of System related to Fare Policy implementation | Appendix 3.7 | 1.2.2 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 261 | 47 | PSR 37-3 | Method of identifying and adapting to Fare policy trends | Appendix 3.7 | 1.3.8.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 262 | 48 | PSR 37-4 | Method for ongoing configurable validation of eligibility for Reduced Fare Group | Appendix 3.7 | 1.3.12.3 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 263 | 49 | PSR 37-5 | Alternative to Fare table | Appendix 3.7 | 1.4 | Technical Proposal Submittal Date | Only required if Proposer wants to suggest an alternative to the Fare table. | | Vol 2 | System Capabilities and Information Security | x | x |
| 264 | 50 | PSR 37-6 | Alternative to Revenue Apportionment table | Appendix 3.7 | 1.4 | Technical Proposal Submittal Date | Only required if Proposer wants to suggest an alternative to the Revenue Apportionment table. | | Vol 2 | System Capabilities and Information Security | x | x |
| 265 | 51 | PSR 37-7 | Experience and understanding of automation of use of Service Failures Data | Appendix 3.7 | 2.1.6.5 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 266 | 52 | PSR 37-8 | Sample Fare calculation log | Appendix 3.7 | 2.1.7.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 267 | 53 | PSR 37-9 | Multiple Fare Policy handling processes | Appendix 3.7 | 2.1.9 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 268 | 54 | PSR 37-10 | Account and Fare processing optimization | Appendix 3.7 | 2.2.6.1 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 270 | 55 | PSR 38-1 | Account management general approach | Appendix 3.8 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 271 | 56 | PSR 38-2 | Customer Accounts | Appendix 3.8 | 3.1.6 | Technical Proposal Submittal Date | Required | See Appendix 3.8 for list of inclusions. | Vol 2 | System Capabilities and Information Security | x | x |
| 272 | 57 | PSR 38-3 | Account management features | Appendix 3.8 | 5.4 | Technical Proposal Submittal Date | Required | See Appendix 3.8 for list of inclusions. | Vol 2 | System Capabilities and Information Security | x | x |
| 273 | 58 | PSR 38-4 | System Website conceptual design | Appendix 3.8 | 6.7.7 | Technical Proposal Submittal Date | Required | | Vol 2 | System Capabilities and Information Security | x | x |
| 275 | 59 | PSR 38-5 | Administrator Interface conceptual design | Appendix 3.8 | 6.8.5 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | System Capabilities and Information Security | x | x |
| 276 | 60 | PSR 38-6 | IVR conceptual design | Appendix 3.8 | 6.9.3.8 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | System Capabilities and Information Security | x | x |
| 83 | 61 | PSR Exp2 | Proposer Team experience: System capabilities and information security | Appendix 2.5 | 8 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 3.1, 3.1B, 3.7, 3.8 and 3.10. | Vol 2 | System Capabilities and Information Security | x | x |
| 217 | 62 | PSR Exp2 | Proposer Team experience: System capabilities and information security | Appendix 3.1 | 17 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.5, 3.1B, 3.7, 3.8 and 3.10. | Vol 2 | System Capabilities and Information Security | x | x |
| 223 | 63 | PSR Exp2 | Proposer Team experience: System capabilities and information security | Appendix 3.1B | 5 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.5, 3.1, 3.7, 3.8 and 3.10. | Vol 2 | System Capabilities and Information Security | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|---|---------------|-----------|-----------------------------------|---|---|------------------|---|-----------------------|--------|
| 269 | 64 | PSR Exp2 | Proposer Team experience: System capabilities and information security | Appendix 3.7 | 4 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.5, 3.1, 3.1B, 3.8 and 3.10. | Vol 2 | System Capabilities and Information Security | x | x |
| 277 | 65 | PSR Exp2 | Proposer Team experience: System capabilities and information security | Appendix 3.8 | 7 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.5, 3.1, 3.1B, 3.7 and 3.10. | Vol 2 | System Capabilities and Information Security | x | x |
| 284 | 66 | PSR Exp2 | Proposer Team experience: System capabilities and information security | Appendix 3.10 | 2 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.5, 3.1, 3.1B, 3.7 and 3.8. | Vol 2 | System Capabilities and Information Security | x | x |
| 158 | 67 | PSR 212-1 | Vehicle Installations and Removals general approach | Appendix 2.12 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 160 | 68 | PSR 212-2 | Wiring for System Validation Equipment conceptual design | Appendix 2.12 | 1.2.2.4.1 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Wiring for System Validation Equipment conceptual design. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 159 | 69 | PSR 212-2.1 | Wiring for System Validation Equipment conceptual design Location of DC to DC converter | Appendix 2.12 | 1.1.4.1 | Technical Proposal Submittal Date | Only required if proposed for use. | Subject to Design Review as part of the Wiring for System Validation Equipment conceptual design. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 168 | 70 | PSR 211-2.4 | Preliminary Project Management Plan Preliminary timeline for farebox removal | Appendix 2.12 | 7.1.1.1 | Technical Proposal Submittal Date | Required | Part of the Preliminary Project Management Plan Submittal described in Appendix 2.11. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 161 | 71 | PSR 212-3 | Mounting locations for System Validation Equipment conceptual design | Appendix 2.12 | 2.4.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 162 | 72 | PSR 212-4 | Approach to Vehicle installation | Appendix 2.12 | 4.3.2 | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 163 | 73 | PSR 212-4.1 | Approach to Vehicle installation Holes in Vehicles | Appendix 2.12 | 5.4.1.7.1 | Technical Proposal Submittal Date | Required | Part of the Approach to Vehicle installation Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 164 | 74 | PSR 212-4.2 | Approach to Vehicle installation Modifications to ceiling or sidewall of Vehicle | Appendix 2.12 | 5.4.3.8.1 | Technical Proposal Submittal Date | Only required if the SI determines a modification to the ceiling or sidewall is required. | Part of the Approach to Vehicle installation Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 165 | 75 | PSR 212-4.3 | Approach to Vehicle installation Terminal types | Appendix 2.12 | 5.4.6.1 | Technical Proposal Submittal Date | Required | Part of the Approach to Vehicle installation Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 166 | 76 | PSR 212-4.4 | Approach to Vehicle installation Modifications to the Vehicle electrical systems | Appendix 2.12 | 5.5.1.1 | Technical Proposal Submittal Date | Only required if the SI determines a modification to the electrical system is required. | Part of the Approach to Vehicle installation Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 167 | 77 | PSR 212-4.5 | Approach to Vehicle installation Modifications to multiplexing systems | Appendix 2.12 | 5.5.2.1 | Technical Proposal Submittal Date | Only required if the SI proposes modifications. | Part of the Approach to Vehicle installation Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 336 | 78 | PSR 212-4.6 | Approach to Vehicle installation Site preparation work | Appendix 5.2 | 1.2.9 | Technical Proposal Submittal Date | Only required if the SI proposes to do site preparation work prior to the Installation Commencement Date. | Part of the Submittal requirement described in Appendix 2.12. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 56 | 79 | PSR 23-12 | Gate Option selection | Appendix 2.3 | 8 | Technical Proposal Submittal Date | Required | See Appendix 2.3 for list of inclusions. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 57 | 80 | PSR 23-12.1 | Gate Option selection Itemization of AFC 1.0 Equipment re-use | Appendix 2.3 | 8 | Technical Proposal Submittal Date | Only required if the SI proposes to re-use AFC 1.0 Gates. | See Appendix 2.3 for list of inclusions. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 58 | 81 | PSR 23-12.2 | Gate Option selection Itemization of AFC 1.0 Equipment removal | Appendix 2.3 | 8 | Technical Proposal Submittal Date | Required | See Appendix 2.3 for list of inclusions. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 59 | 82 | PSR 23-12.3 | Gate Option selection Itemization of AFC 1.0 Equipment modifications | Appendix 2.3 | 8 | Technical Proposal Submittal Date | Only required if the SI proposes to re-use AFC 1.0 Gates. | See Appendix 2.3 for list of inclusions. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 61 | 83 | PSR 23-12.4 | Gate Option selection Second Stage Work for Gate Option 2 and 3 | Appendix 2.3 | 8.6.1 | Technical Proposal Submittal Date | Only required if SI proposes to use Gate Option 2 or 3. | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 62 | 84 | PSR 23-12.5 | Gate Option selection Second Stage Work for Gate Option 4 | Appendix 2.3 | 8.7.1 | Technical Proposal Submittal Date | Only required if SI proposes to use Gate Option 4. | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 124 | 85 | PSR 29-2 | Gate configuration | Appendix 2.9 | 3.1.4.4 | Technical Proposal Submittal Date | Required | Same Submittal will be considered for multiple evaluation topics. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|--|---------------|-------------------|-----------------------------------|--|---|------------------|---|-----------------------|--------|
| 60 | 86 | PSR 23-13 | Gate replacement transition plan | Appendix 2.3 | 8.2.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 190 | 87 | PSR 214-1 | Procurement and Execution Support for DB Installation Work general approach | Appendix 2.14 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 198 | 88 | PSR 216-1 | Testing proposal | Appendix 2.16 | 8.1 | Technical Proposal Submittal Date | Required | See Appendix 2.16 for list of inclusions. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 199 | 89 | PSR 216-1.1 | Testing proposal Description of tests to be performed | Appendix 2.16 | 8.1.1 | Technical Proposal Submittal Date | Required | Part of the Testing proposal Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 200 | 90 | PSR 216-1.2 | Testing proposal Approach to reporting and remediation | Appendix 2.16 | 8.1.2 | Technical Proposal Submittal Date | Required | Part of the Testing proposal Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 201 | 91 | PSR 216-1.3 | Testing proposal Sample subset of testing Documentation | Appendix 2.16 | 8.1.3 | Technical Proposal Submittal Date | Required | Part of the Testing proposal Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 202 | 92 | PSR 216-1.4 | Testing proposal User testing plan | Appendix 2.16 | 8.1.4 | Technical Proposal Submittal Date | Required | Part of the Testing proposal Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 32 | 93 | PSR 216-1.5 | Testing proposal Name of safety testing laboratory | Appendix 2.3 | 4.2-1 | Technical Proposal Submittal Date | Required | Part of approach to meeting specific requirements of Customer-Facing Devices Submittal. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 72 | 94 | PSR 24-1.7 | Model office plans Approach to configuration modes and data Obfuscation | Appendix 2.4 | 4 | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 65 | 95 | PSR 24-1 | Model Office plans | Appendix 2.4 | Multiple sections | Technical Proposal Submittal Date | Required | See sub-items for list of inclusions. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 66 | 96 | PSR 24-1.1 | Model Office plans General approach | Appendix 2.4 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 67 | 97 | PSR 24-1.2 | Model Office plans Model Office layout | Appendix 2.4 | 1.1.12 | Technical Proposal Submittal Date | Required | Part of Model Office specifications. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 68 | 98 | PSR 24-1.3 | Model Office plans Plans for vehicle availability and access | Appendix 2.4 | 1.2.7.2 | Technical Proposal Submittal Date | Required | Part of Model Office plans. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 70 | 99 | PSR 24-1.5 | Model Office plans Cash pool approach | Appendix 2.4 | 3.1.1 | Technical Proposal Submittal Date | Only required if proposing to use actual cash at Model Office. | Part of Model Office plans. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 71 | 100 | PSR 24-1.6 | Model office plans Model Office isolation | Appendix 2.4 | 3.2.1 | Technical Proposal Submittal Date | Required | Part of Model Office plans. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 73 | 101 | PSR 24-1.8 | Model Office plans Description of Model Office support | Appendix 2.4 | 5.2.2 | Technical Proposal Submittal Date | Required | Part of Model Office plans. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 334 | 102 | PSR 51-1 | Approach to support during Installation and the Transition Period | Appendix 5.1 | 1.3 | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 338 | 103 | PSR 53-1 | Pilots general approach | Appendix 5.3 | 1.3.1 | Technical Proposal Submittal Date | Required | To serve as the conceptual design of the Pilot plans. Subject to Design Review. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 115 | 104 | PSR 28-1 | Expansion general approach | Appendix 2.8 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 116 | 105 | PSR 28-2 | Unplanned Expansion delivery time commitments | Appendix 2.8 | 1.3.1 | Technical Proposal Submittal Date | Required | Based on the table provided in Appendix 2.8, Attachment 1. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 117 | 106 | PSR 28-3 | Details of Expansion projects included in the base award | Appendix 2.8 | 2.2.3 | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 118 | 107 | PSR 28-4 | Device interoperability approach | Appendix 2.8 | 3.3.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 119 | 108 | PSR 28-5 | Plan for maintenance and self-reporting for Readers acquired through Expansion | Appendix 2.8 | 3.4 | Technical Proposal Submittal Date | Required | | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 63 | 109 | PSR Exp3 | Proposer team experience: Implementation, expansion, DB oversight and testing | Appendix 2.3 | 9 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.4, 2.8, 2.12, 2.13, 2.14, 2.16 and 5. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|---|---------------|-------------------|-----------------------------------|----------|--|------------------|---|-----------------------|--------|
| 74 | 110 | PSR Exp3 | Proposer Team experience: Implementation, expansion, DB oversight and testing | Appendix 2.4 | 6 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3, 2.8, 2.12, 2.13, 2.14, 2.16 and 5. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 120 | 111 | PSR Exp3 | Proposer team experience: Implementation, Expansion, DB oversight and testing | Appendix 2.8 | 2 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3, 2.4, 2.12, 2.13, 2.14, 2.16 and 5. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 169 | 112 | PSR Exp3 | Proposer team experience: Implementation, expansion, DB oversight and testing | Appendix 2.12 | 8 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3, 2.4, 2.8, 2.13, 2.14, 2.16 and 5. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 189 | 113 | PSR Exp3 | Proposer team experience: Implementation, expansion, DB oversight and testing | Appendix 2.13 | 6 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.14, 2.16 and 5. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 191 | 114 | PSR Exp3 | Proposer team experience: Implementation, expansion, DB oversight and testing | Appendix 2.14 | 5 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.13, 2.16 and 5. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 203 | 115 | PSR Exp3 | Proposer team experience: Implementation, expansion, DB oversight and testing | Appendix 2.16 | 8.2 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.13, 2.14, 2.16 and 5. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 335 | 116 | PSR Exp3 | Proposer team experience: Implementation, expansion, DB oversight and testing | Appendix 5.1 | 6 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.13, 2.14 and 2.16. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 339 | 117 | PSR Exp3 | Proposer team experience: Implementation, expansion, DB oversight and testing | Appendix 5.3 | 7 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3, 2.4, 2.8, 2.12, 2.13, 2.14 and 2.16. | Vol 2 | Implementation, Expansion, DB Oversight and Testing | x | x |
| 144 | 118 | PSR 211-1 | Project Management and Safety general approach | Appendix 2.11 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 145 | 119 | 1-2 | Proposal Form 2 Management team members | Appendix 2.11 | 1.1.1 | Technical Proposal Submittal Date | Required | Part of Proposal Form 2. | Vol 1 Pkg 1 | Management, Maintenance and Reporting | x | x |
| 146 | 120 | PSR 211-2 | Preliminary Project Management Plan | Appendix 2.11 | 1.2 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 147 | 121 | PSR 211-2.1 | Preliminary Project Management Plan Preliminary Project Schedule | Appendix 2.11 | 1.2.5.4 | Technical Proposal Submittal Date | Required | Part of the Preliminary Project Management Plan. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 148 | 122 | PSR 211-2.2 | Preliminary Project Management Plan Plan for adherence to Project Schedule | Appendix 2.11 | 1.2.6 | Technical Proposal Submittal Date | Required | Part of the Preliminary Project Management Plan. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 149 | 123 | PSR 211-2.3 | Preliminary Project Management Plan Preliminary risk management plan | Appendix 2.11 | 1.2.7.1 | Technical Proposal Submittal Date | Required | Part of the Preliminary Project Management Plan. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 150 | 124 | PSR 211-3 | Preliminary/summary implementation plan | Appendix 2.11 | 2.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 151 | 125 | PSR 211-4 | Sample Project status dashboard | Appendix 2.11 | 3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 152 | 126 | PSR 211-5 | Description of Document Control System and Submittal tracking tool | Appendix 2.11 | 3.3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 154 | 127 | PSR 211-6 | Training program conceptual design | Appendix 2.11 | 4.7.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 153 | 128 | 1-2 | Proposal Form 2 Training instructors | Appendix 2.11 | 4.4 | Technical Proposal Submittal Date | Required | Part of Proposal Form 2. | Vol 1 Pkg 1 | Management, Maintenance and Reporting | x | x |
| 155 | 129 | PSR 211-7 | Safety certification plan conceptual design | Appendix 2.11 | 5.1.2.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 156 | 130 | PSR 211-8 | OSHA 300 Summary | Appendix 2.11 | 5.6 | Technical Proposal Submittal Date | Required | Must be provided for the last 3 years for SI and key subcontractors. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 315 | 131 | PSR 46-1 | Maintenance and Self-Reporting general approach | Appendix 4.6 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 16 | 132 | PSR 23-7 | Device maintenance | Appendix 2.3 | Multiple sections | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description <small>Submittal name Section within the Submittal</small> | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|---|---------------|-----------|-----------------------------------|---|--|------------------|---------------------------------------|-----------------------|--------|
| 17 | 133 | PSR 23-7.1 | Device maintenance Alternative temperature logging approach | Appendix 2.3 | 3.4-1 | Technical Proposal Submittal Date | Only required if the SI proposes an alternative approach to temperature logging on the Limited-Functionality FVM. | Part of Device maintenance Submittal. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 19 | 134 | PSR 23-7.2 | Device maintenance Approach to Device removal for maintenance | Appendix 2.3 | 3.6-5.1 | Technical Proposal Submittal Date | Only required if the Device must be removed from Revenue Service for maintenance. | Part of Device maintenance Submittal. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 25 | 135 | PSR 23-7.3 | Device maintenance Approach to manual monitoring of audio output | Appendix 2.3 | 3.10-5 | Technical Proposal Submittal Date | Only required if SI elects not to monitor audio outputs in the AMS. | Part of Device maintenance Submittal. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 27 | 136 | PSR 23-7.4 | Device maintenance Braille sticker maintenance | Appendix 2.3 | 3.13-2 | Technical Proposal Submittal Date | Only required if the use of stickers is proposed. | Part of Device maintenance Submittal. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 30 | 137 | PSR 23-7.5 | Device maintenance Projected spare parts consumption rates | Appendix 2.3 | 4.1-5 | Technical Proposal Submittal Date | Required | Part of Device maintenance Submittal. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 35 | 138 | PSR 23-7.6 | Device maintenance Approach to manual monitoring of Gate enclosure doors | Appendix 2.3 | 5.1.3-6 | Technical Proposal Submittal Date | Only required if SI elects not to monitor Gate enclosure doors in the AMS. | Part of Device maintenance Submittal. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 79 | 139 | PSR 25-5 | Monitoring of CN equipment | Appendix 2.5 | 4.13.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 317 | 140 | PSR 46-2 | Difference between monitoring processes | Appendix 4.6 | 2.1.4 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 326 | 141 | PSR 46-10 | Proposed format and layout for recordkeeping and reporting | Appendix 4.6 | 10 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 327 | 142 | PSR 46-10.1 | Proposed format and layout for recordkeeping and reporting Monthly Summary Report | Appendix 4.6 | 10.2.3 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 318 | 143 | PSR 46-3 | Sample Monitoring Plan | Appendix 4.6 | 2.2.2 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 319 | 144 | PSR 46-4 | Implementation process for the Automated Monitoring Subsystem | Appendix 4.6 | 2.3 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 320 | 145 | PSR 46-5 | Description of System Elements and transactions | Appendix 4.6 | 2.3.3.2.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 321 | 146 | PSR 46-6 | Performance Tracking System | Appendix 4.6 | 3.4 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 322 | 147 | PSR 46-7 | Preventative maintenance plan | Appendix 4.6 | 4.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 323 | 148 | PSR 46-7.1 | Preventative maintenance plan Downtime schedule | Appendix 4.6 | 4.3 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 324 | 149 | PSR 46-8 | Handoff coordination experience | Appendix 4.6 | 6.7 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 325 | 150 | PSR 46-9 | Manual Tap retrieval method | Appendix 4.6 | 8.8 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 296 | 151 | PSR 43-1 | Configuration timeframes | Appendix 4.3 | 1.5 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 297 | 152 | PSR 43-2 | Mechanism and process to notify MBTA of Configurations | Appendix 4.3 | 2 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 298 | 153 | PSR 43-3 | Change Management Plan conceptual version | Appendix 4.3 | 4.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 299 | 154 | PSR 43-4 | System Software list | Appendix 4.3 | 6.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 311 | 155 | PSR 45-1 | Reporting, Data, and Reconciliation general approach | Appendix 4.5 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 312 | 156 | PSR 45-2 | Description of System auditability | Appendix 4.5 | 7 | Technical Proposal Submittal Date | Required | | Vol 2 | Management, Maintenance and Reporting | x | x |
| 313 | 157 | PSR 45-3 | Methodology for asset management | Appendix 4.5 | 11 | Technical Proposal Submittal Date | Required | Subject to MBTA approval. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 157 | 158 | PSR Exp4 | Proposer Team experience: Management, maintenance and reporting | Appendix 2.11 | 10 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 4.3, 4.5 and 4.6. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 300 | 159 | PSR Exp4 | Proposer Team experience: Management, maintenance and reporting | Appendix 4.3 | 7 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.11, 4.5 and 4.6. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 314 | 160 | PSR Exp4 | Proposer Team experience: Management, maintenance and reporting | Appendix 4.5 | 12 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.11, 4.3 and 4.6. | Vol 2 | Management, Maintenance and Reporting | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description <small>Submittal name Section within the Submittal</small> | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|--|--------------|----------|-----------------------------------|---|---|------------------|---------------------------------------|-----------------------|--------|
| 328 | 161 | PSR Exp4 | Proposer Team experience: Management, maintenance and reporting | Appendix 4.6 | 12 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.11, 4.3 and 4.5. | Vol 2 | Management, Maintenance and Reporting | x | x |
| 1 | 162 | PSR 23-1 | Customer-Facing Devices general approach | Appendix 2.3 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 2 | 163 | PSR 23-2 | Proposed Gates | Appendix 2.3 | 2.2.1.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. Submittal will be evaluated in more than one topic. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 11 | 164 | PSR 23-2.1 | Proposed Gates Display technology | Appendix 2.3 | 3.2.3 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 20 | 165 | PSR 23-2.2 | Proposed Gates Security features | Appendix 2.3 | 3.8 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 41 | 166 | PSR 23-2.8 | Proposed Gates Details of Gate doors | Appendix 2.3 | 5.2.3-5 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 42 | 167 | PSR 23-2.9 | Proposed Gates Gate throughput | Appendix 2.3 | 5.3.1-2 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 44 | 168 | PSR 23-2.10 | Proposed Gates Method for remote Gate opening | Appendix 2.3 | 5.3.2-2 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 45 | 169 | PSR 23-2.11 | Proposed Gates Technical specification for I/O signal | Appendix 2.3 | 5.3.3-1 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | |
| 46 | 170 | PSR 23-2.12 | Proposed Gates Approach to queued Taps and throughput | Appendix 2.3 | 5.6-5 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 47 | 171 | PSR 23-2.13 | Proposed Gates Approach to ensuring egress safety during power failure | Appendix 2.3 | 5.7-1 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 3 | 172 | PSR 23-3 | Proposed Fare Vending Machines | Appendix 2.3 | 2.2.1.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. Submittal will be evaluated in more than one topic. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 12 | 173 | PSR 23-3.1 | Proposed Fare Vending Machines Display technology | Appendix 2.3 | 3.2.3 | Technical Proposal Submittal Date | Required | Part of proposed Fare Vending Machines Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 21 | 174 | PSR 23-3.2 | Proposed Fare Vending Machines Security features | Appendix 2.3 | 3.8 | Technical Proposal Submittal Date | Required | Part of proposed Fare Vending Machines Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 48 | 175 | PSR 23-3.3 | Proposed Fare Vending Machines Variants | Appendix 2.3 | 6.1-1 | Technical Proposal Submittal Date | Only required if Proposal includes more than one model for FVMs. | Part of proposed Fare Vending Machines Submittal. Same Submittal required by Section 6.6.2. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 55 | 176 | PSR 23-3.3 | Proposed Fare Vending Machines Variants | Appendix 2.3 | 6.6-2 | Technical Proposal Submittal Date | Required | Part of proposed Fare Vending Machines Submittal. Same Submittal required by Section 6.1-1. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 49 | 177 | PSR 23-3.4 | Proposed Fare Vending Machines Usability considerations for payments at Fare Vending Machines | Appendix 2.3 | 6.4 | Technical Proposal Submittal Date | Required | Part of proposed Fare Vending Machines Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 50 | 178 | PSR 23-3.5 | Proposed Fare Vending Machines Bank note and coin acceptance plan | Appendix 2.3 | 6.4-4 | Technical Proposal Submittal Date | Required | Part of the proposed Fare Vending Machines Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 52 | 179 | PSR 23-3.6 | Proposed Fare Vending Machines Description of FVM not providing change | Appendix 2.3 | 6.4-6 | Technical Proposal Submittal Date | Only required if the Proposal includes a cost-savings option for Fare Vending Machines which do not provide change. | Part of proposed Fare Vending Machines Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 54 | 180 | PSR 23-3.7 | Proposed Fare Vending Machines Plan for currency rejection | Appendix 2.3 | 6.5-2 | Technical Proposal Submittal Date | Required | Part of proposed Fare Vending Machines Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 6 | 181 | PSR 23-4 | Proposed Validators | Appendix 2.3 | 2.2.1.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. Submittal will be evaluated in more than one topic. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 13 | 182 | PSR 23-4.1 | Proposed Validators Display technology | Appendix 2.3 | 3.2.3 | Technical Proposal Submittal Date | Required | Part of proposed Validators Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 22 | 183 | PSR 23-4.2 | Proposed Validators Security features | Appendix 2.3 | 3.8 | Technical Proposal Submittal Date | Required | Part of proposed Validators Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 8 | 184 | PSR 23-5 | Approach to meeting specific requirements of Customer-Facing Devices | Appendix 2.3 | 2.2.1.2 | Technical Proposal Submittal Date | Required | | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 15 | 185 | PSR 23-5.1 | Approach to meeting specific requirements of Customer-Facing Devices Protection from weather, water and dust | Appendix 2.3 | 3.3.1-1 | Technical Proposal Submittal Date | Required | Part of approach to meeting specific requirements of Customer-Facing Devices Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 18 | 186 | PSR 23-5.2 | Approach to meeting specific requirements of Customer-Facing Devices Alternative approach to ensure zero Data loss | Appendix 2.3 | 3.4-2 | Technical Proposal Submittal Date | Only required if not providing a non-volatile, mirrored backup. | Part of approach to meeting specific requirements of Customer-Facing Devices Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 23 | 187 | PSR 23-5.3 | Approach to meeting specific requirements of Customer-Facing Devices Transmission protocol for Customer-Facing Devices | Appendix 2.3 | 3.9.1-1 | Technical Proposal Submittal Date | Required | Part of approach to meeting specific requirements of Customer-Facing Devices Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 24 | 188 | PSR 23-5.4 | Approach to meeting specific requirements of Customer-Facing Devices Display Fare on Tap | Appendix 2.3 | 3.9.1-12 | Technical Proposal Submittal Date | Required | Part of approach to meeting specific requirements of Customer-Facing Devices Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 28 | 189 | PSR 23-5.5 | Approach to meeting specific requirements of Customer-Facing Devices Software and product development process | Appendix 2.3 | 4.1-1 | Technical Proposal Submittal Date | Required | Part of approach to meeting specific requirements of Customer-Facing Devices Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|--|--------------|-----------|-----------------------------------|----------|--|------------------|-------------------------------------|-----------------------|--------|
| 26 | 190 | PSR 23-8 | Usability case study | Appendix 2.3 | 3.12-6 | Technical Proposal Submittal Date | Required | | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 33 | 191 | PSR 23-10 | Approach to Fare loss prevention | Appendix 2.3 | 4.2-6 | Technical Proposal Submittal Date | Required | | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 43 | 192 | PSR 23-11 | Gate variation based on User attributes concept white paper | Appendix 2.3 | 5.3.1-4 | Technical Proposal Submittal Date | Required | Part of proposed Gates Submittal. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 110 | 193 | PSR 27-1 | Inspection Functionality and Devices general approach | Appendix 2.7 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 112 | 194 | PSR 27-2 | Proposed Inspection Device | Appendix 2.7 | 3.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 111 | 195 | PSR 27-2.1 | Proposed Inspection Device Description of record mode | Appendix 2.7 | 1.2.5.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 64 | 196 | PSR Exp5 | Proposer team experience: Devices (except Gate Transition) | Appendix 2.3 | 9 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.7. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 114 | 197 | PSR Exp5 | Proposer team experience: Devices (except Gate Transition) | Appendix 2.7 | 6 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.3. | Vol 2 | Devices (excluding Gate Transition) | x | x |
| 224 | 198 | PSR 32-1 | Reader Processing and Media Acceptance general approach | Appendix 3.2 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 225 | 199 | PSR 32-2 | Reader compliance plan | Appendix 3.2 | 1.1.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 226 | 200 | PSR 32-3 | Choice of Contactless EMV Level 2 specifications | Appendix 3.2 | 1.2.2.3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 227 | 201 | PSR 32-4 | Reader security and protection | Appendix 3.2 | 1.4 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 228 | 202 | PSR 32-4.1 | Reader security and protection Reader authentication | Appendix 3.2 | 1.4.7.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 229 | 203 | PSR 32-4.2 | Reader security and protection Preventing unauthorized devices | Appendix 3.2 | 1.4.8.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 230 | 204 | PSR 32-4.3 | Reader security and protection Protection against physical and virtual attacks | Appendix 3.2 | 1.4.9.2 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 231 | 205 | PSR 32-5 | Approach to minimize impact of future payments technology developments | Appendix 3.2 | 1.6.1.3 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 233 | 206 | PSR 32-6 | Reader auditing capabilities | Appendix 3.2 | 3 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 235 | 207 | PSR 33-1 | AFC 1.0 Media acceptance | Appendix 3.3 | 4 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 237 | 208 | PSR 34-1.1 | Authentication plan Offline Authentication | Appendix 3.4 | 1.2.1 | Technical Proposal Submittal Date | Required | Part of Authentication plan Submittal. | Vol 2 | Readers | x | x |
| 239 | 209 | PSR 34-1.2 | Authentication plan Online authentication | Appendix 3.4 | 1.8.1 | Technical Proposal Submittal Date | Required | Part of Authentication plan Submittal. | Vol 2 | Readers | x | x |
| 240 | 210 | PSR 34-1.3 | Authentication plan Offline risk management approach | Appendix 3.4 | 3.2.1 | Technical Proposal Submittal Date | Required | Part of Authentication plan Submittal. | Vol 2 | Readers | x | x |
| 241 | 211 | PSR 34-4 | Cross-Device Anti-Passback Controls | Appendix 3.4 | 4.4.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Readers | x | x |
| 243 | 212 | PSR 35-1 | Risk management, fraud prevention and Velocity Controls conceptual design | Appendix 3.5 | Intro | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Readers | x | x |
| 238 | 213 | PSR 35-1.1 | Risk management, fraud prevention and Velocity Controls conceptual design BIN blocking | Appendix 3.4 | 1.6.1 | Technical Proposal Submittal Date | Required | Part of the Risk management, fraud prevention and Velocity Controls conceptual design. | Vol 2 | Readers | x | x |
| 244 | 214 | PSR 35-1.2 | Risk management, fraud prevention and Velocity Controls conceptual design Risk management functionality | Appendix 3.5 | 1.8 | Technical Proposal Submittal Date | Required | Part of the Risk management, fraud prevention and Velocity Controls conceptual design. | Vol 2 | Readers | x | x |
| 245 | 215 | PSR 35-1.3 | Risk management, fraud prevention and Velocity Controls conceptual design RCL or HCF file usage | Appendix 3.5 | 2.1.1 | Technical Proposal Submittal Date | Required | Part of the Risk management, fraud prevention and Velocity Controls conceptual design. | Vol 2 | Readers | x | x |
| 246 | 216 | PSR 35-1.4 | Risk management, fraud prevention and Velocity Controls conceptual design Velocity control Configuration | Appendix 3.5 | 2.7.3 | Technical Proposal Submittal Date | Required | Part of the Risk management, fraud prevention and Velocity Controls conceptual design. | Vol 2 | Readers | x | x |
| 247 | 217 | PSR 35-1.5 | Risk management, fraud prevention and Velocity Controls conceptual design Parameters to restrict fraudulent Credential usage | Appendix 3.5 | 2.12.1 | Technical Proposal Submittal Date | Required | Part of the Risk management, fraud prevention and Velocity Controls conceptual design. | Vol 2 | Readers | x | x |
| 248 | 218 | PSR 35-1.6 | Risk management, fraud prevention and Velocity Controls conceptual design Fraud data sharing mechanism | Appendix 3.5 | 2.13.1 | Technical Proposal Submittal Date | Required | Part of the Risk management, fraud prevention and Velocity Controls conceptual design. | Vol 2 | Readers | x | x |
| 249 | 219 | PSR 35-1.7 | Risk management, fraud prevention and Velocity Controls conceptual design Approach to intelligent fraud monitoring | Appendix 3.5 | 2.16.1 | Technical Proposal Submittal Date | Required | Part of the Risk management, fraud prevention and Velocity Controls conceptual design. | Vol 2 | Readers | x | x |
| 234 | 220 | PSR Exp6 | Proposer Team experience: Reader | Appendix 3.2 | 5 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 3.3, 3.4 and 3.5. | Vol 2 | Readers | x | x |
| 236 | 221 | PSR Exp6 | Proposer Team experience: Reader | Appendix 3.3 | 6 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 3.2, 3.4 and 3.5. | Vol 2 | Readers | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|---|---------------|---------|-----------------------------------|---|---|------------------|---------------------------------|-----------------------|--------|
| 242 | 222 | PSR Exp6 | Proposer Team experience: Reader | Appendix 3.4 | 5 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 3.2, 3.3 and 3.5. | Vol 2 | Readers | x | x |
| 250 | 223 | PSR Exp6 | Proposer Team experience: Reader | Appendix 3.5 | 4 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 3.2, 3.3 and 3.4. | Vol 2 | Readers | x | x |
| 131 | 224 | PSR 210-1 | Quantity Standards general approach | Appendix 2.10 | Intro | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 132 | 225 | PSR 210-2 | POS inventory methodology | Appendix 2.10 | 1.8.5 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 133 | 226 | PSR 210-3 | POS Locations | Appendix 2.10 | 2 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 134 | 227 | PSR 210-3.1 | POS Locations FVM Required Locations | Appendix 2.10 | 2.2 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 135 | 228 | PSR 210-3.2 | POS Locations POS Required Locations | Appendix 2.10 | 2.3 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 136 | 229 | PSR 210-3.3 | POS Locations Distributed Locations | Appendix 2.10 | 2.4 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 137 | 230 | PSR 210-4 | FVM Queuing Principle approach | Appendix 2.10 | 3.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Quantity Standards and Retail | x | x |
| 138 | 231 | PSR 210-5.1 | Device quantities Fare Vending Machines | Appendix 2.10 | 3.1 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 140 | 232 | PSR 210-5.2 | Device quantities Gates | Appendix 2.10 | 3.3 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 141 | 233 | PSR 210-5.3 | Device quantities Station Validators | Appendix 2.10 | 3.4 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 142 | 234 | PSR 210-5.4 | Device quantities Vehicle Validators | Appendix 2.10 | 3.5 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 139 | 235 | PSR 210-6 | Retail Reload Location quantities | Appendix 2.10 | 3.2 | Technical Proposal Submittal Date | Required | Subject to Design Review as part of the Quantity Standards conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 192 | 236 | PSR 215-1 | Retail general approach | Appendix 2.15 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Quantity Standards and Retail | x | x |
| 193 | 237 | PSR 215-2 | Point of sale implementation Retail Reload Locations | Appendix 2.15 | 3 | Technical Proposal Submittal Date | Only required if SI elects to use Retail Reload Locations to meet Quantity Standards. | | Vol 2 | Quantity Standards and Retail | x | x |
| 195 | 238 | PSR 215-2.1 | Point of sale implementation Administrative Point of Sales | Appendix 2.15 | 5.4 | Technical Proposal Submittal Date | Required | | Vol 2 | Quantity Standards and Retail | x | x |
| 194 | 239 | PSR 215-3 | Retail functionality conceptual design | Appendix 2.15 | 4.6.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Quantity Standards and Retail | x | x |
| 196 | 240 | PSR 215-4 | Support for future retail features | Appendix 2.15 | 6.2 | Technical Proposal Submittal Date | Only required if SI elects to use Retail Reload Locations to meet Quantity Standards. | | Vol 2 | Quantity Standards and Retail | x | x |
| 100 | 241 | PSR 26-5.4 | Mobile Fare Card conceptual design Adding value to Mobile Fare Card with cash | Appendix 2.6 | 5.7.1 | Technical Proposal Submittal Date | Required | Part of the Mobile Fare Card conceptual design. | Vol 2 | Quantity Standards and Retail | x | x |
| 143 | 242 | PSR Exp7 | Proposer Team experience: Quantity Standards and retail | Appendix 2.10 | 6 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.15. | Vol 2 | Quantity Standards and Retail | x | x |
| 197 | 243 | PSR Exp7 | Proposer Team experience: Quantity Standards and retail | Appendix 2.15 | 7 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.10. | Vol 2 | Quantity Standards and Retail | x | x |
| 218 | 244 | PSR 31A-1 | Privacy approach | Appendix 3.1A | 10.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Privacy | x | x |
| 219 | 245 | PSR Exp8 | Proposer Team experience: privacy | Appendix 3.1A | 11 | Technical Proposal Submittal Date | Required | | Vol 2 | Privacy | x | x |
| 84 | 246 | PSR 26-1 | Closed-loop Fare Media general approach | Appendix 2.6 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Fare Card and Order Fulfillment | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description <small>Submittal name Section within the Submittal</small> | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|--|--------------|-------------|-----------------------------------|---|--|------------------|---------------------------------|-----------------------|--------|
| 85 | 247 | PSR 26-2 | Proposed Fare Card Media | Appendix 2.6 | 1 | Technical Proposal Submittal Date | Required | | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 86 | 248 | PSR 26-2.1 | Proposed Fare Card Media Smartcard chip type for MBTA employee access control | Appendix 2.6 | 1.7.2.2.1 | Technical Proposal Submittal Date | Required | Part of the Proposed Fare Card Media Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 87 | 249 | PSR 26-2.2 | Proposed Fare Card Media Useful life of the Media | Appendix 2.6 | 1.8.2 | Technical Proposal Submittal Date | Required | Part of the Proposed Fare Card Media Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 88 | 250 | PSR 26-2.3 | Proposed Fare Card Media Promotional versions of Fare Card | Appendix 2.6 | 1.9.1 | Technical Proposal Submittal Date | Required | Part of the Proposed Fare Card Media Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 89 | 251 | PSR 26-3 | Fare Card Credential conceptual design | Appendix 2.6 | 3 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 90 | 252 | PSR 26-3.1 | Fare Card Credential conceptual design Digital architecture for Fare Card Credential | Appendix 2.6 | 3.1.1 | Technical Proposal Submittal Date | Required | Part of the Fare Card Credential conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 91 | 253 | PSR 26-3.2 | Fare Card Credential conceptual design Data locally stored on the Fare Card | Appendix 2.6 | 3.3.1 | Technical Proposal Submittal Date | Only required if additional data will be stored. | Part of the Fare Card Credential conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 92 | 254 | PSR 26-3.3 | Fare Card Credential conceptual design Digital architecture for Temporary Fare Card | Appendix 2.6 | 3.5.1 | Technical Proposal Submittal Date | Only required if different from Standard Fare Cards. | Part of the Fare Card Credential conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 93 | 255 | PSR 26-4 | NFC Devices proposal | Appendix 2.6 | 4.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 94 | 256 | PSR 26-4.1 | NFC Devices proposal Alternative Credential for NFC Devices | Appendix 2.6 | 4.2.1 | Technical Proposal Submittal Date | Only required if chip technology cannot be licensed for use as a mobile payment Credential. | Part of the NFC Media proposal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 95 | 257 | PSR 26-4.2 | NFC Devices proposal Explanation of transfer from physical Fare Card Media to NFC Device | Appendix 2.6 | 4.3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 96 | 258 | PSR 26-5 | Mobile Fare Card conceptual design | Appendix 2.6 | 5.1.1 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 97 | 259 | PSR 26-5.1 | Mobile Fare Card conceptual design Approach to supporting Mobile Fare Card reload at all Sales Channels | Appendix 2.6 | 5.3.2 | Technical Proposal Submittal Date | Required | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 106 | 260 | PSR 26-5.10 | Mobile Fare Card conceptual design Access to contact form | Appendix 2.6 | 5.10.3.8.1 | Technical Proposal Submittal Date | Only required if SI is developing a mobile application. | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 107 | 261 | PSR 26-5.11 | Mobile Fare Card conceptual design Access to trip planning tools and service alerts | Appendix 2.6 | 5.10.3.9.1 | Technical Proposal Submittal Date | Only required if SI is developing a mobile application. | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 108 | 262 | PSR 26-5.12 | Mobile Fare Card conceptual design Offline functionality | Appendix 2.6 | 5.10.3.10.1 | Technical Proposal Submittal Date | Only required if SI is developing a mobile application. | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 98 | 263 | PSR 26-5.2 | Mobile Fare Card conceptual design Mobile Fare Card Group and Reduced Fare Group enrollment | Appendix 2.6 | 5.4.1 | Technical Proposal Submittal Date | Required | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 99 | 264 | PSR 26-5.3 | Mobile Fare Card conceptual design Approach to new releases | Appendix 2.6 | 5.6.2 | Technical Proposal Submittal Date | Required | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 101 | 265 | PSR 26-5.5 | Mobile Fare Card conceptual design Use of in-app payment technologies | Appendix 2.6 | 5.10.3.1.1 | Technical Proposal Submittal Date | Only required if SI is developing a mobile application. | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 102 | 266 | PSR 26-5.6 | Mobile Fare Card conceptual design Approach to app distribution and support | Appendix 2.6 | 5.10.3.3.6 | Technical Proposal Submittal Date | Only required if SI is developing a mobile application. | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 103 | 267 | PSR 26-5.7 | Mobile Fare Card conceptual design Approach to optional User authentication | Appendix 2.6 | 5.10.3.6.4 | Technical Proposal Submittal Date | Only required if SI is developing a mobile application. | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 104 | 268 | PSR 26-5.8 | Mobile Fare Card conceptual design Approach to Account management functionality access | Appendix 2.6 | 5.10.3.6.5 | Technical Proposal Submittal Date | Only required if SI is developing a mobile application. | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 105 | 269 | PSR 26-5.9 | Mobile Fare Card conceptual design Access to Sales Channels | Appendix 2.6 | 5.10.3.7.2 | Technical Proposal Submittal Date | Only required if SI is developing a mobile application. | Part of the Mobile Fare Card conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 301 | 270 | PSR 44-1.1 | Approach to Order Fulfillment and Account Servicing General approach | Appendix 4.4 | Intro | Technical Proposal Submittal Date | Required | Part of the Approach to Order Fulfillment and Account Servicing Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 302 | 271 | PSR 44-1.2 | Approach to Order Fulfillment and Account Servicing Alternative approach for Fare Card supply | Appendix 4.4 | 1.2.1 | Technical Proposal Submittal Date | Only required if SI does not agree to keep 6 months supply on hand. | Part of the Approach to Order Fulfillment and Account Servicing Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 303 | 272 | PSR 44-1.3 | Approach to Order Fulfillment and Account Servicing Custom Fare Card sales | Appendix 4.4 | 3.4 | Technical Proposal Submittal Date | Required | Part of the Approach to Order Fulfillment and Account Servicing Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 304 | 273 | PSR 44-1.4 | Approach to Order Fulfillment and Account Servicing Limit for number of Fare Cards associated with a Group Accounts or bulk orders | Appendix 4.4 | 4.2.2.1 | Technical Proposal Submittal Date | Required | Part of the Approach to Order Fulfillment and Account Servicing Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 305 | 274 | PSR 44-1.5 | Approach to Order Fulfillment and Account Servicing Plan for immediate fulfillment of Fare Card orders | Appendix 4.4 | 4.2.3 | Technical Proposal Submittal Date | Required | Part of the Approach to Order Fulfillment and Account Servicing Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 309 | 275 | PSR 44-1.6 | Approach to Order Fulfillment and Account Servicing Limit for number of Fare Cards allowed in batch requests | Appendix 4.4 | 6.1.2.1 | Technical Proposal Submittal Date | Required | Part of the Approach to Order Fulfillment and Account Servicing Submittal. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 306 | 276 | PSR 44-2 | Conversion and migration plan conceptual design | Appendix 4.4 | 5 | Technical Proposal Submittal Date | Required | Subject to Design Review. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 307 | 277 | PSR 44-2.1 | Conversion and migration plan conceptual design Balance conversion experience, understanding and approach | Appendix 4.4 | 5.1.2 | Technical Proposal Submittal Date | Required | Part of the conversion and migration plan conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------|--|---------------|-------------------|-----------------------------------|----------|---|------------------|------------------------------------|-----------------------|--------|
| 308 | 278 | PSR 44-2.2 | Conversion and migration plan conceptual design Group program migration approach | Appendix 4.4 | 5.2.1 | Technical Proposal Submittal Date | Required | Part of the conversion and migration plan conceptual design. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 109 | 279 | PSR Exp9 | Proposer Team experience: Fare Card and Order Fulfillment | Appendix 2.6 | 10 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 4.4. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 310 | 280 | PSR Exp9 | Proposer Team experience: Fare Card and Order Fulfillment | Appendix 4.4 | 8 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 2.6. | Vol 2 | Fare Card and Order Fulfillment | x | x |
| 251 | 281 | PSR 36-1 | Electronic payment processing general approach | Appendix 3.6 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 252 | 282 | PSR 36-2 | Description of SI's Acquirer certifications | Appendix 3.6 | 1.2.2 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 253 | 283 | PSR 36-3 | Approach to minimize authorizations | Appendix 3.6 | 2.8.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 254 | 284 | PSR 36-4 | Magnetic stripe acceptance | Appendix 3.6 | 4.5.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 255 | 285 | PSR 36-5 | Web international payment acceptance | Appendix 3.6 | 5.7.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 256 | 286 | PSR 36-7 | Description payments via touchtone and IVR | Appendix 3.6 | 6.3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 285 | 287 | PSR 41-1 | Cash handling plan | Appendix 4.1 | Multiple sections | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 286 | 288 | PSR 41-1.1 | Cash handling plan General approach | Appendix 4.1 | Intro | Technical Proposal Submittal Date | Required | Part of the Cash handling plan. | Vol 2 | Revenue Collection and Remittance | x | x |
| 287 | 289 | PSR 41-1.2 | Cash handling plan Sample cash collection schedule | Appendix 4.1 | 1.1.1.1 | Technical Proposal Submittal Date | Required | Part of the Cash handling plan. | Vol 2 | Revenue Collection and Remittance | x | x |
| 288 | 290 | PSR 41-1.3 | Cash handling plan Cash collection procedures | Appendix 4.1 | 1.1 | Technical Proposal Submittal Date | Required | Part of the Cash handling plan. | Vol 2 | Revenue Collection and Remittance | x | x |
| 289 | 291 | PSR 41-1.4 | Cash handling plan Description of cash handling facilities | Appendix 4.1 | 2.1.3.1 | Technical Proposal Submittal Date | Required | Part of the Cash handling plan. | Vol 2 | Revenue Collection and Remittance | x | x |
| 290 | 292 | PSR 41-1.5 | Cash handling plan Protection plan | Appendix 4.1 | 2.2 | Technical Proposal Submittal Date | Required | Part of the Cash handling plan. Must be approved by MBTA Transit Police. | Vol 2 | Revenue Collection and Remittance | x | x |
| 292 | 293 | PSR 42-1 | Flow of Funds general approach | Appendix 4.2 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 294 | 294 | PSR 42-2 | Method for deposit | Appendix 4.2 | 1.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 329 | 295 | PSR 47-1 | Payment Service Providers and qualifications | Appendix 4.7 | 1.2.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 330 | 296 | PSR 47-1.1 | Payment Service Providers and qualifications Demonstration of PSP ability | Appendix 4.7 | 2.1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 331 | 297 | PSR 47-1.2 | Payment Service Providers and qualifications Payment Card processing | Appendix 4.7 | 2.2 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 332 | 298 | PSR 47-1.3 | Payment Service Providers and qualifications ACH processing | Appendix 4.7 | 2.3 | Technical Proposal Submittal Date | Required | | Vol 2 | Revenue Collection and Remittance | x | x |
| 257 | 299 | PSR Exp10 | Proposer Team experience: Revenue collection and remittance | Appendix 3.6 | 7 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 4.1, 4.2 and 4.7. | Vol 2 | Revenue Collection and Remittance | x | x |
| 291 | 300 | PSR Exp10 | Proposer Team experience: Revenue collection and remittance | Appendix 4.1 | 4 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 3.6, 4.2 and 4.7. | Vol 2 | Revenue Collection and Remittance | x | x |
| 295 | 301 | PSR Exp10 | Proposer Team experience: Revenue collection and remittance | Appendix 4.2 | 5 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 3.6, 4.1 and 4.7. | Vol 2 | Revenue Collection and Remittance | x | x |
| 333 | 302 | PSR Exp10 | Proposer Team experience: Revenue collection and remittance | Appendix 4.7 | 11 | Technical Proposal Submittal Date | Required | Combined with Submittal requirement described in Appendix 3.6, 4.1 and 4.2. | Vol 2 | Revenue Collection and Remittance | x | x |
| 278 | 303 | PSR 39-1 | Application Programming Interfaces general approach | Appendix 3.9 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | Application Programming Interfaces | x | x |
| 279 | 304 | PSR 39-2 | Model for API Documentation | Appendix 3.9 | 1.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Application Programming Interfaces | x | x |
| 281 | 305 | PSR 39-4 | Standards on which APIs will be based | Appendix 3.9 | 1.7 | Technical Proposal Submittal Date | Required | | Vol 2 | Application Programming Interfaces | x | x |
| 69 | 306 | PSR 24-1.4 | Model Office plans API testing approach | Appendix 2.4 | 1.4.1 | Technical Proposal Submittal Date | Required | | Vol 2 | Application Programming Interfaces | x | x |
| 280 | 307 | PSR 39-3 | Plan for API performance, reliability and features | Appendix 3.9 | 1.3 | Technical Proposal Submittal Date | Required | | Vol 2 | Application Programming Interfaces | x | x |
| 282 | 308 | PSR Exp11 | Proposer Team experience: Application Programming Interfaces | Appendix 3.9 | 6 | Technical Proposal Submittal Date | Required | | Vol 2 | Application Programming Interfaces | x | x |
| 170 | 309 | PSR 213-1 | Plans and Specifications for DB Installation Work general approach | Appendix 2.13 | Intro | Technical Proposal Submittal Date | Required | | Vol 2 | DB Plans and Specifications | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|--------------|---|---------------|-------------------------|-----------------------------------|---|--|------------------|-----------------------------|-----------------------|--------|
| 171 | 310 | PSR 210-5 | Device quantities | Appendix 2.13 | 1.1.1 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. The same information is required by Submittals in Appendix 2.10. Submittal will be considered for multiple evaluation topics. | Vol 2 | DB Plans and Specifications | x | x |
| 172 | 311 | PSR 210-3 | POS Locations | Appendix 2.13 | 1.1.1 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. The same information is required by Submittals in Appendix 2.10. Submittal will be considered for multiple evaluation topics. | Vol 2 | DB Plans and Specifications | x | x |
| 337 | 312 | PSR 213-10.1 | Interface plan (preliminary) Site preparation work | Appendix 5.2 | 1.2.9 | Technical Proposal Submittal Date | Only required if the SI proposes to do site preparation work prior to the Installation Commencement Date. | Part of the Submittal requirement described in Appendix 2.13. | Vol 2 | DB Plans and Specifications | x | x |
| 173 | 313 | PSR 213-2 | Device specifications (preliminary) | Appendix 2.13 | 1.1.2 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 174 | 314 | PSR 213-3 | Quantity calculation description | Appendix 2.13 | 1.1.3 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 175 | 315 | PSR 213-4 | Phase-in plan (preliminary) | Appendix 2.13 | 1.2 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 176 | 316 | PSR 213-5 | Survey and field work needs (preliminary) | Appendix 2.13 | 1.3.1 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 177 | 317 | PSR 213-6 | Program permit list (preliminary) | Appendix 2.13 | 1.3.2 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 178 | 318 | PSR 213-7 | Installation site rules and regulations (preliminary) | Appendix 2.13 | 1.3.3 and 1.3.4 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 179 | 319 | PSR 211-6.1 | Training program summary DB Entity training program summary | Appendix 2.13 | 1.3.5 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. The same information should also be included in the Training program summary Submittal in Appendix 2.11. | Vol 2 | DB Plans and Specifications | x | x |
| 180 | 320 | PSR 213-8 | DB Entity project management guide (preliminary) | Appendix 2.13 | 1.3.6, 1.3.7, and 1.3.8 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 181 | 321 | PSR 213-9 | Summary of technical approach to DB Installation Work | Appendix 2.13 | 1.4 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 29 | 322 | PSR 213-4.3 | Summary of technical approach to DB Installation Work Description of flooring repairs | Appendix 2.3 | 4.1-2 | Technical Proposal Submittal Date | Required | As part of the Construction contract specifications (preliminary) described in Appendix 2.13. | Vol 2 | DB Plans and Specifications | x | x |
| 182 | 323 | PSR 213-10 | Interface plan (preliminary) | Appendix 2.13 | 1.5 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 183 | 324 | PSR 213-11 | Gate installation details (preliminary) | Appendix 2.13 | 1.6 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 184 | 325 | PSR 213-12 | Station Validator installation details (preliminary) | Appendix 2.13 | 1.7 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 185 | 326 | PSR 213-13 | Fare Vending Machine installation details (preliminary) | Appendix 2.13 | 1.8 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |
| 186 | 327 | PSR 213-14 | CN Equipment installation details (preliminary) | Appendix 2.13 | 1.9.1 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. | Vol 2 | DB Plans and Specifications | x | x |

| Order in RFP | Order in Proposal | Submittal # | Description Submittal name Section within the Submittal | Document | Section | Due Date | Required | Notes | Proposal Section | Evaluation Topic | Responsiveness Review | Scored |
|--------------|-------------------|-------------------------------|--|---------------|---------|-----------------------------------|---|---|------------------|--|-----------------------|--------|
| 187 | 328 | PSR 25-6 | Use of MBTA Layer 2 Services | Appendix 2.13 | 1.9.2 | Technical Proposal Submittal Date | Required | Part of the Preliminary DB Plans and Specifications. The same information is required by a Submittal in Appendix 2.5 and will be considered for multiple evaluation topics. | Vol 2 | DB Plans and Specifications | x | x |
| 188 | 329 | PSR 23-15 | DB Plans and Specifications Advancement Plan | Appendix 2.13 | 3.2 | Technical Proposal Submittal Date | Required | | Vol 2 | DB Plans and Specifications | x | x |
| 9 | 330 | Technical Proposal Evaluation | Demonstration Customer Facing Devices | Appendix 2.3 | 2.2.2 | During the Proposal evaluation | Required | At Proposer offices during the Technical Proposal Evaluation. | N/A | Devices (excluding Gate Transition) | | x |
| 34 | 331 | Technical Proposal Evaluation | Demonstration Customer Facing Devices impact resistance | Appendix 2.3 | 4.2-10 | During the Proposal evaluation | Required | At the Proposer offices during the Technical Proposal Evaluation. | N/A | Devices (excluding Gate Transition) | | x |
| 53 | 332 | Technical Proposal Evaluation | Demonstration FVM not providing change | Appendix 2.3 | 6.4-6 | During the Proposal evaluation | Only required if the Proposal includes a cost-savings option for Fare Vending Machines which do not provide change. | Part of the demonstration. | N/A | Devices (excluding Gate Transition) | | x |
| 113 | 333 | Technical Proposal Evaluation | Demonstration Inspection Device | Appendix 2.7 | 3.2 | During the Proposal evaluation | Required | | N/A | Devices (excluding Gate Transition) | | x |
| 259 | 334 | Technical Proposal Evaluation | Demonstration Fare policy and fare calculation | Appendix 3.7 | Intro | During the Proposal evaluation | Required | | N/A | System Capabilities and Information Security | | x |
| 274 | 335 | Technical Proposal Evaluation | Demonstration Website demonstration | Appendix 3.8 | 6.7.8 | During the Proposal evaluation | Required | Part of the demonstration. | N/A | System Capabilities and Information Security | | x |
| 293 | 336 | Technical Proposal Evaluation | Demonstration Flow of funds | Appendix 4.2 | Intro | During the Proposal evaluation | Required | | N/A | Revenue Collection and Remittance | | x |
| 316 | 337 | Technical Proposal Evaluation | Demonstration Maintenance and self-reporting | Appendix 4.6 | Intro | During the Proposal evaluation | Required | | N/A | Management, Maintenance and Reporting | | x |
| 10 | 338 | Technical Proposal Evaluation | Proposer interview | Appendix 2.3 | 2.2.3 | During the Proposal evaluation | Required | At MBTA offices during the Technical Proposal Evaluation. | N/A | Devices (excluding Gate Transition) | | x |
| 51 | 339 | 3-19 | Proposal Form 14 Price for FVM not providing change | Appendix 2.3 | 6.4-6 | Financial Proposal Submittal Date | Only required if the Proposal includes a cost-savings option for Fare Vending Machines which do not provide change. | Part of the price proposal. Table 7 in Form 14. | Vol 3 Pkg 3 | | x | x |
| | 340 | PSR 27-3 | Proposed Inspection Device Development Process | Appendix 2.7 | 3.1 | Technical Proposal Submittal Date | Required | | Vol 2 | | | |